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**National College of Art and Design
Faculty of Design
Department of Industrial Design**

The In-Line Skate and The Design of the Rollerblade.

by

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Introduction

“Man has always desired speed and it was this moment that the wheel was created for.” (Chalmers,1997, p. 12)

Rollerblading is the common term used today to describe in-line skating, Rollerblade is actually a company name but due to the companies success it has now become the term used to describe the activity. In-line skating has become one of the fastest developing sports that the world has encountered to date. In ten years it has grown from unknown to one of the top choices of sport at present, people all over the world are participating. In the USA alone more than 30 million men and women own skates and use them regularly. Europe is now beginning to feel the In-line “buzz” and starting to follow the Americans with over 20 million people in Europe now taking to the streets participating in this new sport, recreation, lifestyle. More commonly referred to as Rollerblades or “blades”, they are hybrids of ice skates and traditional roller skates that have taken the world by storm. People have many explanations for their choice in mode of transport. This extension of the leg/foot offers a convenient way to get from A to point B. They are relatively light and are much quicker than walking and less destructive (to oneself) than running, and they offer a number of recreational options.

The transformation of the skate has seen and influenced many changes in the skating industry and has also had its impact on the consumers, the users lifestyle and street style. In-line skating is writing itself into the

history books for numerous reasons be it innovations, speed, fitness. The thesis examines the evolution of the roller-skate, and the key historical events that brought the skate through decades of innovations and its transformation into what it is today. This re-styled roller-skate/ice-skate entered the market and was initially responsible for its success as more than just a toy, a fun object for children. The company behind the product, Rollerblade continues to be the world leader in skate sales. In-line skating is a sport, which enhanced ground skating and brought it to a level as a sport it had not achieved previously and progressed speed skating which had not managed to break into the market during the roller-skating boom. Today fitness is becoming more associated with fun, it's no longer an effort or struggle, with new innovations and methods of keeping fit we are all heading towards a healthier and fitter future. In-line skate are a fitness product and in-line skating has superior advantages and benefits to that of other sports such as running. The Aeroblade by Rollerblade is one of the first skates marketed to be saleable worldwide. It examines how materials and technologies have influenced the manufacture and overall aesthetic of the in-line skate. Ergonomics plays a major part of design and the in-line skate is no exception being required to fit basic functional requirements and ergonomic constraints which are examined throughout this chapter. The re-marketing of the skate and the targeting of specific markets. It examines how the skate was marketed initially and how the key to the success of the skate was partially due to one person who saw an opportunity and explored it, to make it a sensation, a lifestyle product. The style and fashion implications in-line

skating is having and where its influences have come from.

The literature available on the background and design of the in-line skate is at present minimal. There are very few books available that analyse the in-line skate in any detail. In Industrial Design Reflection of a Century (DeNoblet, 1993) it mentions the Aeroblade but does not go into any depth on the overall design commenting briefly on its overall aesthetic. The Dictionary of 20th Century Designers (Dormer, 1991) is also very inadequate, describing the skate in two brief sentences. In Line Skating Basics (Millar, 1996) and 1st in Line Rolling (Heeley, 1996) were a useful source to gather a background on the techniques involved and the different uses in-line skates can be used for. Fitness In-Line Skating was a helpful book making me aware of the benefits of in-line skating but was really a book instructing step by step fitness programs rather than an analysis. When discussing the influence of fashion Street Style (Polhemus, 1994a) and Street Surfing (Polhemus 1994b) were helpful for the formulation of ideas. ADCULT (Twitchell, 1995) when approaching the marketing aspect was a good background read discussing the different approaches to advertising and marketing with particular reference to America. Periodicals were the most helpful source of information on all aspects of in-line skating with the most up to date information on changes and innovations in the skating industry. Skater was a good source for this information analyzing skates and interviewing users on a regular basis. Domus (Tumminelli, 1993) had a well structured three page description of one of Rollerblades newest innovations, the ABT braking system which

looked at the system in depth and the impact it was going to have on the skating world.

1.0 The History of Rollerskating.

Since their arrival in the early eighties in-line skates have changed the whole concept of roller-skating and captured the minds of ice-skaters, pedestrians, skiers etc. and spawned a sport which has now become the fastest new sport or pastime in America and trends in Europe are now beginning to mirror those of the US.

“ Those who have trundled leisurely around the park on heavy, leather strapped metal roller-skates would barely relate the high-tech modern In-line skates, like those traditional “quads”. In-line skates, like those by the Us manufacturer Rollerblade, are closer in design to ice-skates than roller skates.”(Tambini, 1996, p. 163)

The evolution of the roller-skate (dry land skate) and their recent explosion back into the sport's world requires an explanation as to where and when it all started and how the revival began and how it became such a success. History has it that roller-skating all began in the early 1700s in Holland when a Dutchman nailed wooden spools to strips of wood and attached them to his shoes. The new dry land skates were adopted for summer traveling and were christened Skeeters. (Fig. 1)

Joseph Merlin a mechanic has the official credit for making the first pair of roller-skates. A news piece of the day carried this account.

“One of his ingenious novelties was a pair of skates contrived to run on small metallic wheels. Supplied with a pair of skates and a violin he mixed in the mottay group of one - of the celebrated Mrs Cornelly's masquerades at Carlisle House, Soho Square, when not having provided the means of retarding his velocity or communising his direction, he impelled himself against a mirror of more than 500 pounds value, dashed it to atoms, broke his instrument to pieces and wounded himself

severely.”(Zaidman, 1997)

1818 roller-skates made a greatest impact in the premier of the German ballet *Der Maler Oder die Wintervergn Ugungen* (The Artist of Winter Pleasures). The ballet called for ice-skating but because it was impossible



Figure 1 Skeeter

at that time to have a production with ice on stage, roller-skates became the perfect solution. The first patent for a roller skate was issued to a M. Petibledin in France in 1819. The skate consisted of a wooden sole and was fitted with two, three, or four copper, wooden, or ivory rollers arranged in a straight line. In London in 1823, Robert John Tyers patented a volito. In the British patent office the volito was described as an “apparatus” to be attached to boots, shoes and other covering for the feet for the purpose of travelling or for pleasure. The volito consisted of five wheels attached in a straight line. The lapse that had been experienced nearly 100 years earlier was experienced again for 20 years before it became a phenomenal success. Roller-skating then invaded the Grand Opera’s production of *Le Ballet des Patineurs* (The Skaters Ballet) skating became a sensation.(Internet, 1997, <http://www.usacrs.com.museum.htm>)



Public rinks were soon to become popular and 1857 saw the opening of rinks in Floral Hall of Covent Garden and in The Strand, London(Fig.2).

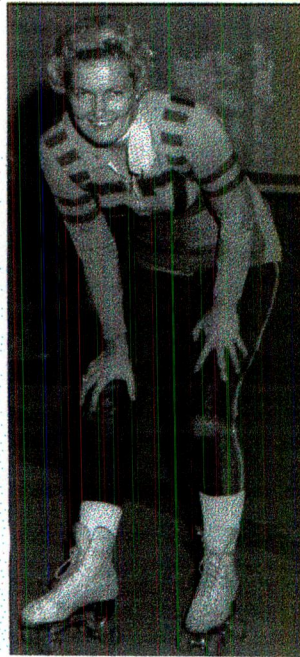
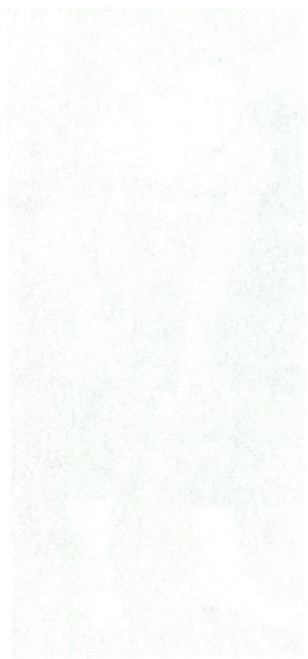


Figure 2 Roller derby queen covent gardens

It was in 1863 an American named James Leonard Plimpton rearranged the wheels and put them on springs, that they left their (indelible) mark on the rink and pavement. The skate consisted of two parallel sets of wheels, one pair under the ball of the foot and the other pair under the heel. Working on rubber springs the four wheels were made of boxwood. The skate could move in a smooth curve, this feature out-classed previous skates which to date were unable to move in a curve and his overall design was superior to any other skate on the market. Roller skating rinks now become a popular social area and rinks began to rocket up one of the more popular ones at the time being in Crystal Palace but died due to mismanagement. Rinks were re-opened, redeveloped bigger and better



than ever, in Chicago (The Casino Rink) at twenty-fourth and Madison opened in 1884 to crowds of thousands. All sorts of experiments began on skates polo, roller racing, roller dancing.

The next big decline hit the roller skating industry with the arrival of the bicycle in the 1890s pushing roller-skating into decline for the next decade. Ball bearings were introduced and the roller-skate was seen again. The Chicago Coliseum opened to the public attended by 7000 people. Madison Square Garden in 1908 was transformed into a rink, and hundreds of more rinks were opened throughout England and the US. After World War 1 there again was a decline due to the arrival of movies, dancing (clubs) and cars. It was dancing and roller-skating combined brought the next boom, introducing roller-discos, over 4,000 in operation. (Zaidman, 1997)

1.1 The appearance of In-Line Skates.

The arrival of the In-line skate and the history behind it is somewhat unclear to date, history goes that the first In-line skate was made in the 1700s but as to who was the real inventor of the modern In-line skate is unclear. Most definitely a re-vamped roller-skate it's origins are credited with different people. Ralph Backstrom, one of the fastest skaters of his time, played for the Montreal Canadians on the National Hockey League in the 1960s, made a version of an In-line skate in order to train during the off season.

Around 1980 two hockey playing Minnesota brothers arrived upon an In-

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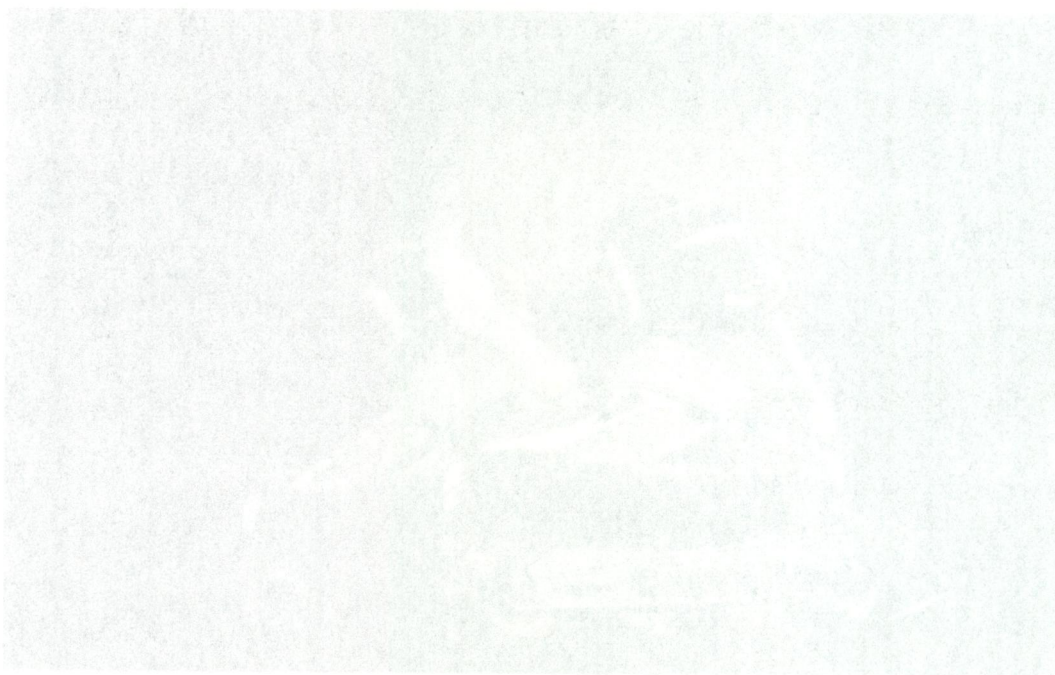
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line skate in a sporting goods store and saw it as a perfect off-season training tool for hockey. After they explored various systems of enhancing the wheel arrangement both for themselves and friends the skate was gradually refined and modified. Realising the potential of the skate from the general interest created among hockey-playing friends, off season cross country skiers and the general public, they built a small business which eventually grew into what it is today. "Rollerblade Inc." Realising the huge growth, potential of the sport of In-line skating several other companies became involved in the manufacture and development of the skate(Fig. 3) to its potential status of where it is today a billion dollar



Figure 3 The Aeroblade by rollerblade

business. With this huge growth in the skating sector came new organisations. The International In-line Skating Association (IISA) created in 1991, keeps in touch with large manufacturers in order to maintain awareness of consumer needs and to promote safety. The IISA



Instructor Certification Program, the only recognised training programme for In-line skating instructors. (Heeley, 1996, p. 13)

In-line skate clubs have sprung up in cities around the world. These, clubs disseminate information on special events of interest to their members, sponsor various local and national series speed skating races and help to keep club members in touch with some of the latest developments in the In-line world. Freestyle, ramp, vertical and street skaters have become well organised in America. 1994 was the first year of competitions in these areas under the banner of the National In-line Skate Series (NISS). Most professional events are now sanctioned under the ASA (Aggressive Skating Association). In-line speed skating now attracts top Olympic ice skaters who race and use In-line skaters for off ice training. In 1996 In-line racing was an exhibition sport at the summer Olympics in Atlanta and is set only to expand and thrive throughout the world allowing the public see the emergence of the fastest growing "sport" in America. (Powell, 1993, p. 157)

2.0 Rollerblade, Company Origins.

The rollerblade story begins back in 1980 with the two Minnesota brothers that came across the in-line skate in an old sports store and attempted to re-style its image. Their company was only serving and targeting the in-line skate as a training tool. It was only after the company was sold in 1984 that strategic marketing efforts were introduced to position in-line skating as a new sport. Rollerblade became the first company in modern times to manufacture skates with all the wheels arranged in a line but did not at first make a huge impact on the then disco dominated skating scene. In-line skates did not gain the status that follows them today until 1987, by then the disco-dominated scene had become dormant, this was the time for Rollerblade. At this time the company only consisted of sixteen employees and generalized sales less than 3 million. The basic customers being off-season hockey players. Today the Minneapolis based company is credited with creating one of the fastest growing sports in the United States. By changing the perception of rollerblade skates, seen as just a training tool for male athletics it created the in-line skating boom. Rollerblade is now the world leader in the skating market. (Internet, 1997, <http://www.rollerblade.com>)

Since they originated Rollerblade has been the leader in innovation and accumulated several industry 'firsts' such as the use of polyurethane boots and wheels, metal frames, dual bearings and heel brakes. Rollerblade were also responsible for developing the first wheel with a core giving increased speed, and the first non-metal frame, which added comfort and

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2. The second part of the report deals with the specific results of the work. It is divided into three main sections: the first section deals with the results of the work in the field of agriculture, the second section deals with the results of the work in the field of industry, and the third section deals with the results of the work in the field of commerce.

3. The third part of the report deals with the conclusions and recommendations. It is divided into two main sections: the first section deals with the conclusions, and the second section deals with the recommendations.

4. The fourth part of the report deals with the appendix. It contains a list of the names of the persons who have contributed to the work, a list of the names of the institutions which have provided financial assistance, and a list of the names of the institutions which have provided technical assistance.

lightness to their skate. Other firsts were buckle closures ventilated shells, breathable liners, and memory foam liners a custom fit. Increased pressure to develop a better solution to the existing break system at the time resulted in Rollerblade introducing the biggest innovation to hit the industry - the award winning active break technology (ABT), a cuff achievable - braking system that makes stopping easier to learn on in-line skates and provides better speed control. Overall the company holds

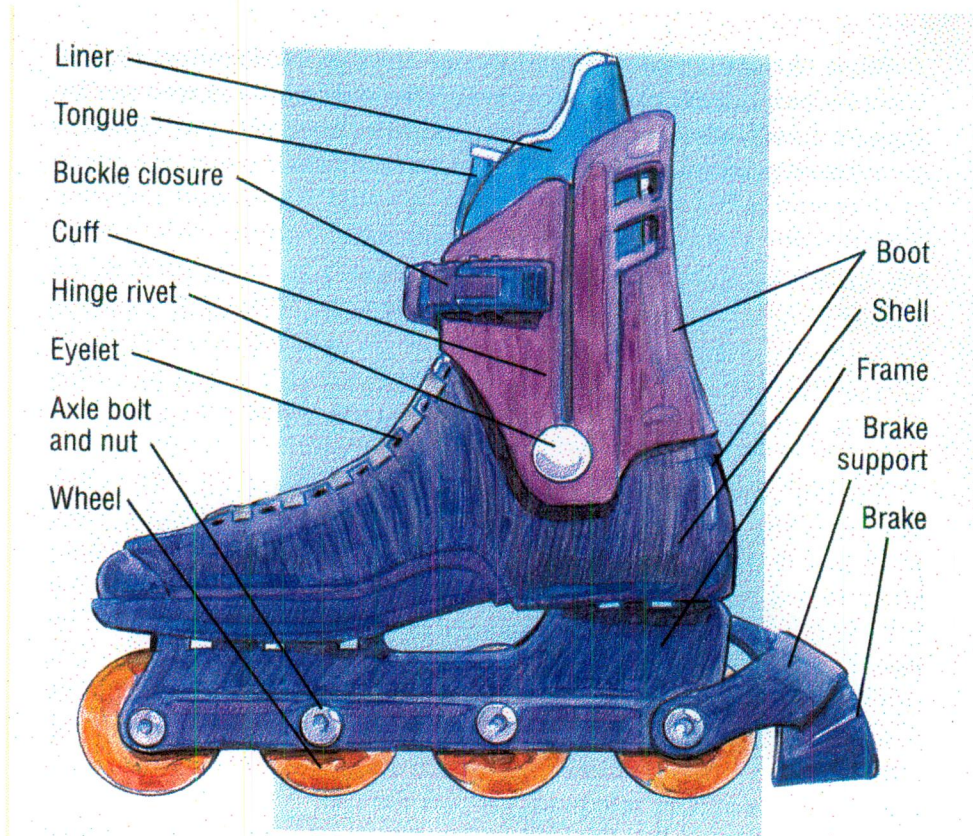


Figure 4 Parts drawing

approximately 200 issued and pending patents for in-line skating products. The companies current product line involves a variety of skates for men, women and youth. The company also offers children skates, created for 6-12 year olds with Rollerblade quality and rigid ankle support necessary for young skaters(Fig 4). In 1991 the company sales rose to

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over \$100 million, representing a 70 percent share of the market, fought over by no less than 30 competitors.

(Internet, 1997, <http://www.rollerblade.com/innovations>)

3.0 The Sport of In-Line Skating.

"Some see In-lines as a boon to the sport. Others more skeptical, see it as just another passing phase that will fizz out - after fracturing the already fragile image of a sport struggling to hold up a unified front to the world long enough to impress the IOC." (Powell, 1993, p. 153)

Today in-line skating has made the skating industry much more prosperous as a sport and as a product. In pre in-line skate years, there was no push to make roller-skating a sport it was a past-time fun activity enjoyed by the remaining few from the roller disco era struggling to hold onto a past to avoid a change, a future. It was the In-line skaters appearance on the streets, in the car parks, out of the rinks that allowed skating fashion a new image and direction and push it to the limits and take advantage of its full potential. It is in the area of speed skating that In-line is really considered a potential sport it is a fast growing area, racing is at the elite, competitive edge of the In-line skating spectrum and is the purest representation of sport. It was the first form of In-line skating to be organized at a competitive level and its success has and is leading to new rules and standards in other prospects of In-line. Racing gives the opportunity of the thrill of speed, endurance, and the opportunity to participate at the highest possible level. The reasons that speed skating did not manage to break into the market with the roller-skating boom was because they were too awkward to use at high speeds. In-lines are easier to skate on at higher speeds over uneven surfaces, and that is their attraction to the speed skater. In-lines can travel at a speed of up to forty miles an hour on downhill grades and twenty-five to thirty miles over flat surfaces. The design of the In-line skate, with the use of

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lightweight materials enhances the speed and even makes them look, faster, superior and stronger than traditional quads (Roller-skates). While some people that are involved in the professional end of skating still choose the roller-skate it is because at present the roller-skate can still compete with In-line skates over short distances because they can get a lot more push off the skate with all the wheels on the ground and the extra weight, but over anything longer than sixty five yards the weight is too much. They start tiring out twice as fast as the participants on in-line skates.

Dante Muse, World Champion speed skater, who has broken and holds many records in the professional arena of speed skating had the following to say about the advancement of speed-skating since the arrival of In-lines.

“ I think it's improved our sport... it's put everybody back to even again it's like everyone had to start over and everyone's starting at the same point. It put a little bit more excitement back into the people. Some of the people were getting a little used to skating on quads, doing the same thing, so it sparked people in that way... It's drawn skaters that skated a while back then retired. It's brought back a lot of old people, not just regular skaters but people that never skated before. It's also hit a bigger market.” (Heeley, 1993, P.56)

Many confederations and clubs that were roller-skating run saw the potential damage in-line skates could have on their existence, which saw them in 1993 liberalizing it's rules to allow its speed skaters the freedom to enter any competitions without penalty. Clubs were fairly quick to accommodate in-line skaters and were wise to do so at least this way they might pro-long their existence, Kirk Spellman, USAC's Sports Information

Director was quoted as saying.

“In lines are a lot faster. You would be hard pressed to find anyone involved in speed skating - either as an athlete, coach or fan - who would not agree with that. Does this mean that quads are on their way out in speed skating competitions? I don't know, but it's certainly a possibility.(Carr, 1990, p. 54-56)

The introduction of in-line skating (speed) in the Olympics in Atlanta in 1992 as an exhibition sport must be an indication of things to come and on the future of in line skating. For a sport that only took off in 1989 and be introduced into the Olympics three years later is a great achievement and shows it has great potential. Speed skating(Fig. 5) does not just involve



Figure 5 Speed skating

throwing on a pair of “blades” and taking to the roads, generally a standard four wheeled skate will serve you adequately, to compete at top levels five wheels are used. Serious racers today tend to customize their own boots by using all the available replacement parts that exist. The most successful speed skaters today need regular training, and the right equipment are the keys to success in racing. Due to the importance of

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aerodynamics experienced racers do without all the protective equipment except the helmet which is mandatory. Elbow and knee pads cause wind drag which inhibits the racers speed if worn. With roller-skating now taking a back-seat to in-line skates and the organizations being phased out in-line skating appears to be set for a prosperous future.

"I can't see anything being faster than in-lines. As far as racing on them, it's not a passing trend." (Dante Muse - World Champion Speed Skater)

3.1 The Fitness Approach.

In the 1970s people all over the world became conscious of their health and fitness and began to physically push themselves with only one thought in mind, to get in shape. People discarded habits that were associated as being unhealthy such as smoking, fat intake as fears for failing health grew. The 1970s saw jogging make an impact as millions of people got equipped with trainers in search to increase their fitness. Most ended up settling for shin splints instead. Now in the 1980s with knees, ankles, backs and assorted other joints effected by a decade of pounding the streets due to the repeated impact of the foot landing on the ground sending shocks up along the leg. People have gone in search of low impact alternatives, from step up aerobics to workouts on other various machines.

Today fun is the key element. Over the past few years, designers have been designing a range of sports products that are changing the way we

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stay in shape. The more successful efforts have gone not into thinking up gimmicky new pursuits but rather improving existing ones. The snow board from the snow ski, the mountain bike from the road bike and the most successful transformation yet,

In-line Skates from roller skates.

Compared with four of the top five participation sports in the US (walking, swimming, bicycling, and indoor exercising) In-line skating ranks as a very convenient activity in terms of equipment necessary, initial fitness level requirements, diversity of benefits, and the potential to socialize during performance. How good can something that's so much fun be? Experts and analysis have shown their answers.

Study 1: In 1994 Dr. Carl Foster of the US Speed Skating team tested in line skaters against runners and cyclists(Fig 6) his results in a 30 minute workout, for a 170 pound person could burn 450 calories on In-line skates, in the same 30 minutes, a runner would burn 375 calories and a cyclist 225. (Sleepers burn about 60 calories every 30 minutes).(Internet, 1997, <http://www.HealthBenifits.com/skating>)

Study 2: The human performance laboratory at the University of Wisconsin lacrosse recently compared the effects of In line skating when compared with running. The result - Heavy exertion on both resulted in

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similar maximum heart rates - 189 beats per minute for In-line skating compared with 194 beats per minute for the treadmill in addition the study found In-line skating burned from 9.5 to 19 calories per minute on a pace of 9 to 12 miles per hour (approx. the equivalent of a five to six minute mile running race).

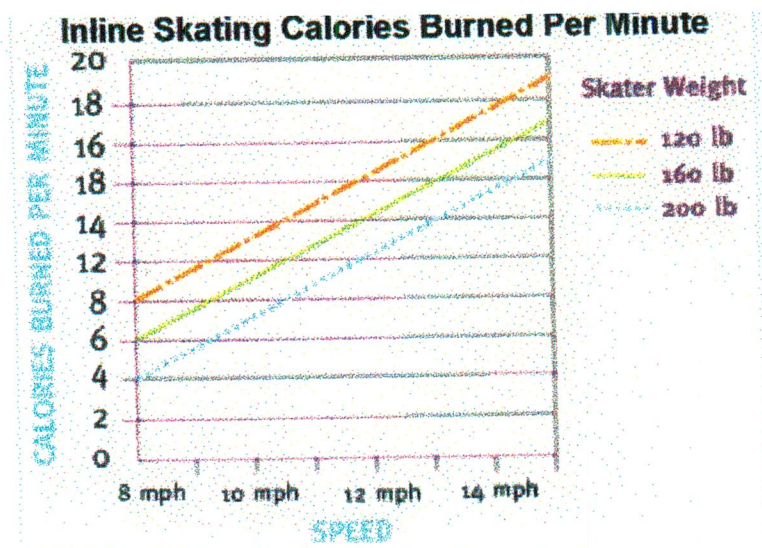


Figure 6 Calorie usage

Study 3: Utilizing high tech measuring devices and a specially designed treadmill to compare the impact shock of In-line skating to running. College students were fitted with accelerometers at both their tibia and forehead to measure peak accelerations during running and In-line skating. The study concluded that skating caused less than half the impact of running when carrying peak accelerations for both the tibia (2.02gs for skating Vs 4.22gs for running and then level. 0.45g for skating Vs 0.91gs for running). In-line skates because of their low impact are less harmful for participants than running due to the fact that repeated high

impacts have been associated with degenerative joint disease and injuries such as stress fractures and lower back pain.

(Internet, 1997, <http://www.HealthBenifits.com/skating>)

Study 4: Oxygen uptake heart rate and blood rate were measured in eleven volunteers, all competent In line skaters during four different workouts: running, cycling, 30 minutes steady inline skating and a incremental inline skating workout, in which participants skated one mile four timed at progressively increasing velocities paced by a bicycle.

Results:-

- Calorie expenditure: During a 30 minute period: On the average inline skating at a steady comfortable rate expends 285 calories and produces a heart rate of 148 beats per minute.
- Interval skating (alternating one minute of hard skating in a tuck position with one minute of easy skating in an upright position). Expand 450 calories in 30 minutes.
- Running and cycling expend 350 and 360 calories respectively, at a heart rate of 148 beats per minute.
- In general, the faster / harder one skates the faster one burns calories.

- Aerobic benefits: Aerobic tests measure how the heart and the lungs work together.
- In line skating was found to be a better aerobic workout than cycling, but not as good as running. Thus is because it is easier to coast while cycling than while skating and impossible to coast while running. Inline skaters can increase their aerobic workout by skating harder or skating uphill.(Fig. 7), (Levin, 1992, p. 119-121)

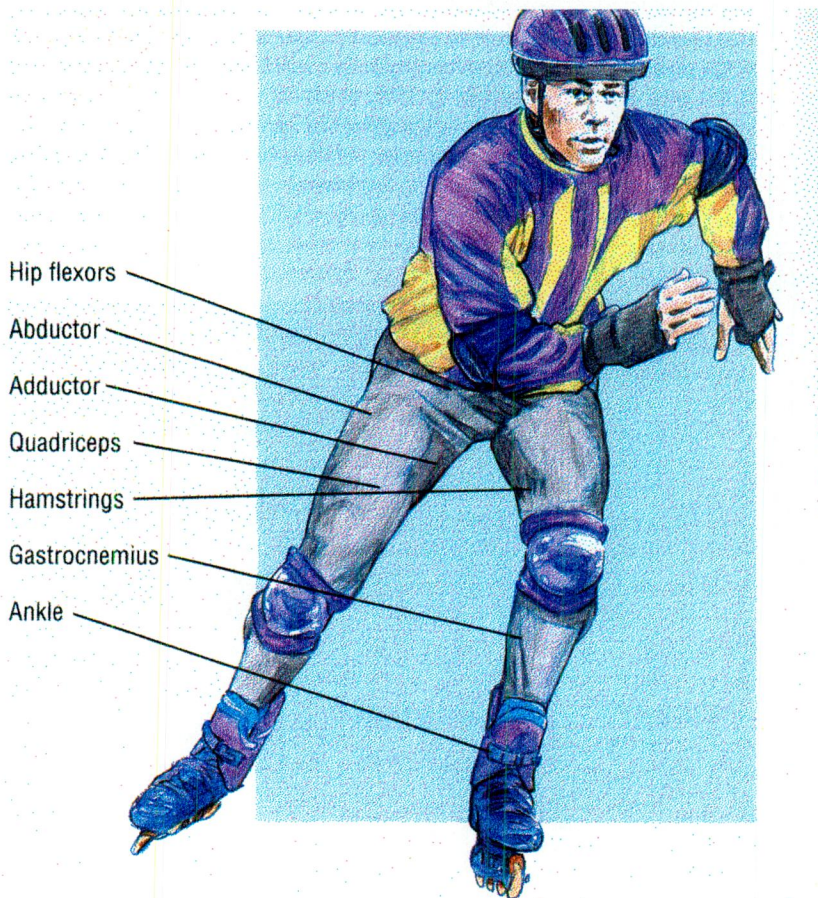


Figure 7 Muscle usage

Anaerobic benefits:-

Anaerobic benefits determine how well a workout strengthens and develops muscles. In general a person who is working out wants to burn fat, not muscles. Studies show that women who use diet only to reduce weight may lose 40 percent of their weight from muscle tissue.

Anaerobically inline skating was found to be more beneficial than both running and cycling, because it is intrinsically easier and more natural for building hip and thigh muscles that are not developed in the other two forms of exercise. Unlike cycling, inline skating develops hamstring muscles. And unlike running, inline skating is a low impact activity. A separate study conducted at human performance lab found that inline skating develops muscles in the entire upper leg, rear and hip, as well as the lower back. Muscles in the upper arms and shoulders are also developed when arms are swing vigorously while skating. (Carr, 1990, p. 54-56)

It provides a good all round fitness programme - cardiovascular or cardiorespiratory fitness (endurance), muscular fitness (muscular strength and muscular endurance), body composition and flexibility. Balance and coordination, the balance and coordination you acquire simply by participating will improve your overall body balance and coordination in everyday movements. The rate of calorie burning is directly related to your body weight, thus different people will burn different amounts of calories. Different size skate frames, wheel diameter and conditions also

play a roll in the amount of calories burnt.

4.0 Design Strategy.

Today the constant study and design of objects relates a message about the changes that are constantly taking place in society and informs us that design, society and individuals induce change. Today taste is formed by what people are offered and if they do not have the chance to look, observe, feel, own and utilize well designed products how can they discover if they like them? The early 1980s experienced a re-entering of the industrial world and witnessed the development of new approaches, consumers became more demanding with regard to product quality, durability and safety. Manufacturers advertised and promoted their products as something more, something different as opposed to letting the product sell itself, they used marketing and advertising to influence people. Design is now no longer a matter of simply producing but a question of developing communications strategy. It was and is to formulate a product 'philosophy' and to assure the coherence of the whole. Today companies have realized innovation can be managed and produced, it is not necessary to wait for a random breakthrough. Today distinguishing ones products in a crowded environment where everyone has similar aims (making products that are simple, easy to use and with a high quality appearance) involves a pooling of expertise and definite direction. I will analyse the Aeroblade from Rollerblade, which will demonstrate the regulated topics that will need consideration when designing a product for the public.

4.1 Product Design.

Problems dealt with in the design of the aeroblade are functional and

exhibit the transition from a heavy apparatus to a much lighter one. The product addresses technology and demonstrates how it can be used to totally re-style an existing product and bring it to further peoples thoughts and ambitions and give people / consumers the unknown, unseen, unheard of. Today in the mid 1990s flexibility is all. Industrial Designers can be expected to interact with the production line on a visual, mechanical, engineering and product design basis. Innovation can be managed and produced. Skates are now a widely accepted "lifestyle" product that can be used by just about anyone professional athletes, fitness enthusiasts and for fun. The innovation of the in line skate exhibits a prime example of the extent to which new materials can effect the look of a consumer product. The boot becomes an amateur of the foot and the wheels transform the body into a vehicle.(Tumminelli, 1995, p. 92)

Wheels have the greatest effect on performance, choosing wheels that match your skating style category is a huge consideration. Designing in-line skates involves designing for different markets and attracting different consumers be it recreation, hockey, aggressive racing or children all the above require different features and equipment to be a success amongst their target group and wheels being a vital consideration. The number of wheels that are mounted on an in-line frame can vary depending on the intended use of the skates, the size of the frame and the skaters foot. Standard skates have four wheels some small skates have three and most speed skates have five. The profile of a wheels running surface can vary from a very pointed radius to a blunt almost flat radius. Pointed or narrow radius wheels have less running surface, quicker

1. The first part of the report deals with the general situation of the country and the progress of the work during the year. It is divided into two main sections: the first section deals with the general situation of the country and the progress of the work during the year, and the second section deals with the specific work done during the year.

2. The second part of the report deals with the specific work done during the year. It is divided into three main sections: the first section deals with the work done in the field, the second section deals with the work done in the laboratory, and the third section deals with the work done in the office.

3. The third part of the report deals with the results of the work done during the year. It is divided into three main sections: the first section deals with the results of the field work, the second section deals with the results of the laboratory work, and the third section deals with the results of the office work.

4. The fourth part of the report deals with the conclusions drawn from the work done during the year. It is divided into three main sections: the first section deals with the conclusions drawn from the field work, the second section deals with the conclusions drawn from the laboratory work, and the third section deals with the conclusions drawn from the office work.

5. The fifth part of the report deals with the recommendations made for the future work. It is divided into three main sections: the first section deals with the recommendations made for the field work, the second section deals with the recommendations made for the laboratory work, and the third section deals with the recommendations made for the office work.

steering and are faster, while wider radius profile wheels are more stable yet slower. The size of the wheels is measured in mm's on the outside diameter. Smaller wheels are used for street or track skating, while larger wheels are used for recreational to speed skating. Smaller wheels turn and accelerate more quickly, large wheels are slower to accelerate but have greater heightened speed.

The boot also consists of other key elements composed of several parts, includes a variety of complex plastic elements for high performance applications. The flexible steel polyurethane boot, moulded in three asymmetrical hinged segments is sculpted and ventilated for lightness (Fig 8). The shell is attached to a frame of two piece glass reinforced nylon that offers rigidity and is fitted with an inner boot of multi-density foams and mesh which incorporates an air inflation component. Using these complex elements and materials, the designer takes them in a positive form when it comes to designing the outer form of the boot. The above materials themselves determine the foundations for the skate, of which the designer works with, because each material used, is used specifically to enhance the products ability be it for speed or breathing ability, the designer does not try to change this but enhance it. Materials used therefore play a vital role in the aesthetic of the skate and determine a lot of its features. So basically the designer is given the basics and develops them as he/she sees fit. The overall aesthetic has a very distinctive and traceable form being very similar to that of a ski-boot, resembling the ski-boots form and using the same buckle closure system

which allows the boot be directly related to skiing and to a sport. Bringing



Figure 8 Aeroblade exploded view

it's overall interpretation and association up from a fun object to a sophisticated piece of sports equipment which becomes associated with speed and endurance.

Designing new products means to interfere with languages and forms of behavior and thus to contribute to the generation of new lifestyles. In-line skates have become a means of transport and hence a symbol of younger



American Metropolitan generation. As do the surfers and motorcyclists. In line skaters express an inner need for self propulsion, their skates allow them to get up high speeds and to perform activities that become a risk, a threat in order to achieve an unpresented and released adrenaline now known as the clean drug of the 20th Century (Tumminelli, 1995, p. 91). A sense of national identity has now become important to in line skaters whether it is international or not they have risen to be placed alongside the world of surfers.

Style is implemented through many variants the skate itself is marketed as being very stylistic and aerodynamic but its not just in the skate that style is being implemented, but through development in active gear which consists of jackets, glasses, pants and all the protective gear, as do the surfers and bikers, in-line skaters now exhibit a distinctive style and blend and all the gear becomes a unit and are being sold as a unit with the skate as a basis for an overall style which as already mentioned bears close resemblance to that of the ski-range. As previously stated product shape is influenced by production technology and use (kettle needs a handle skates need to move). But another two imperatives also render products more uniform.

First the need for many products to be saleable world wide and second the desire that all manner of products should be saleable world wide.

1. The first part of the report is a general introduction to the subject.

2. The second part is a detailed description of the methods used in the study.

3. The third part is a discussion of the results of the study.

4. The fourth part is a conclusion and a list of references.

5. The fifth part is a summary of the main findings of the study.

6. The sixth part is a list of the names of the authors and their institutions.

7. The seventh part is a list of the titles of the papers presented at the conference.

8. The eighth part is a list of the names of the speakers and their topics.

9. The ninth part is a list of the names of the organizers and their institutions.

10. The tenth part is a list of the names of the sponsors and their institutions.

11. The eleventh part is a list of the names of the participants and their institutions.

12. The twelfth part is a list of the names of the members of the steering committee.

13. The thirteenth part is a list of the names of the members of the advisory committee.

14. The fourteenth part is a list of the names of the members of the secretariat.

15. The fifteenth part is a list of the names of the members of the finance committee.

16. The sixteenth part is a list of the names of the members of the program committee.

17. The seventeenth part is a list of the names of the members of the logistics committee.

18. The eighteenth part is a list of the names of the members of the publicity committee.

19. The nineteenth part is a list of the names of the members of the registration committee.

20. The twentieth part is a list of the names of the members of the catering committee.

21. The twenty-first part is a list of the names of the members of the accommodation committee.

22. The twenty-second part is a list of the names of the members of the transportation committee.

23. The twenty-third part is a list of the names of the members of the security committee.

24. The twenty-fourth part is a list of the names of the members of the medical committee.

25. The twenty-fifth part is a list of the names of the members of the fire safety committee.

26. The twenty-sixth part is a list of the names of the members of the first aid committee.

27. The twenty-seventh part is a list of the names of the members of the lost and found committee.

28. The twenty-eighth part is a list of the names of the members of the lost and found committee.

4.2 Colour.

Industrial designers are often criticized for their failure to use colour, they have a reputation for designing black boxes and for using a palette which only extends from black to shades of grey. Some industrial designers are unadventurous with colour, but unusual colour groupings are not always practical when designing a range of products which have mass appeal and a long life cycle. Such is the case with the aeroblade, targeting a mass appeal world wide it has to use colours that will appeal to various cultures so it finds itself amongst those products considered in the black box syndrome. Using the right greys and blacks a product can be quite effective and this is achieved in the aeroblade. In the 1960s black was seen to be chic and then color became the norm but today black's and greys if carefully used are seen as sophisticated such as the Aeroblade.

The fact that the aeroblade was the first in-line skate designed to have an impact world wide it could not be bold in its use of colour, but today now that the in-line skate has gained world wide acceptance the door is opened to experiment with increased colour to attract the emerging markets. The growth in companies has also lead to a race to attract customers before the competitor, this is being achieved through hundreds of methods colour and innovation. While rollerblade leads the way in innovation other companies have looked towards colour. Rollerblades still resorts to an overall black or grey usually matt with coloured trims. Their is good reason for their huge association with the dark colours they use, number one it has now become very much associated with rollerblades and is

carried as a distinguished feature of the skate, and number two a lot of skaters that focus on racing hockey and aggressive skating tend to use their skates at every moment they have and really put them through a good workout jumping, sliding, racing and all these actions make the skate prone to wear and tear faster than any other category of skater. So the use of dark matt colours tend to wear better, and are less prone to showing up scratches and other damaging features as easily as brighter colours. Other companies such as Roces, Fila, K2 and now Nike(Fig 9) are



Figure 9 Nike Air Warp

producing skates using more colour in order to compete with rollerblade and focus on other markets. Recreational skaters, the children's market and other emerging groups tend not to need the endurance and strength skates in the previously mentioned markets need so leave them open to interpret colour in a different way looking at the recreational, fun aspect of skating. The Fila interval has now become strongly associated with the recreation skater, consisting of a soft boot designed for the male or female skater, is dominated with a white and blue flash and exhibits a minimum of black, even the chassis and wheels have diverged from black the wheels being a red and the chassis a tinged purple. The skate looks attractive and targets the fun aspect of skating which its succeeding in very successfully. Other companies which are following the same pattern are

Nike with the Air Warp and Bauer with their women specific and Roces with fifth Element are now using and experimenting with colour to corporate at the highest level in the fastest growing lifestyle sport.

4.3 Function.

Ornament does not play a vital role in the design of the aeroblade, function is the main dominant consideration that fuels the design of in-line skates, extra features being added not for the purpose of ornament but function. Such is the case with rollerblades new ABT braking system(Fig. 10) which consists of a form of fin which is integrated in to the back of the skate, this is a necessary feature within the skate to enhance

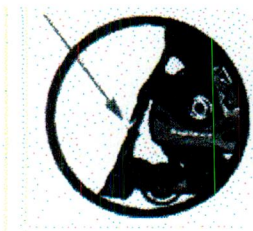


Figure 9 ABT braking system

braking and not for ornament as may appear on first encounters - it is a patented revolutionary braking system only from rollerblade that allows a skater to stop with all eight wheels on the pavement. The brake works by just sliding your braking foot forward (left / right your choice) without a need to lift the toe of the skate up. The pressure on the rear cuff of the skate causes the brake to press down on the pavement. It has an

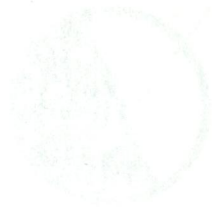
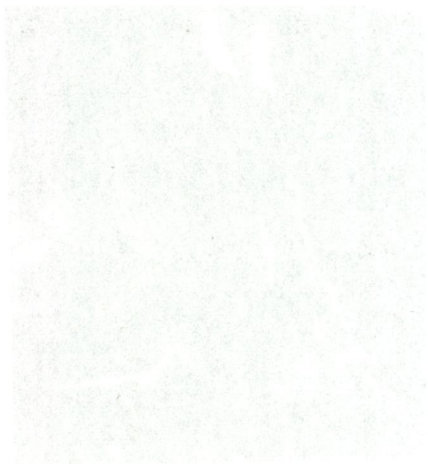
1. The first part of the report deals with the general situation of the country and the progress of the work during the year. It also mentions the results of the various investigations and the conclusions drawn from them.

2. The second part of the report deals with the results of the various investigations and the conclusions drawn from them. It also mentions the progress of the work during the year and the general situation of the country.

3. The third part of the report deals with the results of the various investigations and the conclusions drawn from them. It also mentions the progress of the work during the year and the general situation of the country.

4. The fourth part of the report deals with the results of the various investigations and the conclusions drawn from them. It also mentions the progress of the work during the year and the general situation of the country.

5. The fifth part of the report deals with the results of the various investigations and the conclusions drawn from them. It also mentions the progress of the work during the year and the general situation of the country.



adjustable arm which incorporates the arm itself to precisely adjust the

brake height to one of several pre-established brake heights. (Tumminelli, 1995, p. 92)

4.4 Ergonomic Constraints.

The skates must meet basic functional requirements. Ergonomics becomes a major focus and is the reason for many features within and on the boot that give that needed comfort and interaction required to produce a satisfactory product. The most important feature is ankle support making the designer consider (1) the user (2) the category (3) injuries. Too much expenditure of effort could cause potential damage and injuries, movements must be organized in a way so that leverage of the bones and use of the muscles are forced to work in the least effort feasible. The designer tackles the above problems by firstly building an inner shoe of polyurethane foam with a built in inner mesh that provides greater stability, a snug fit while still remaining very comfortable. The outer shell or body apparatus is made from an ABS plastic structure which focuses on giving the ankle that extra support needed to prevent it enduring too much movement and prevent twisting the ankle keeping it in a relatively confined space. Ventilation of the foot is very important and is overcome by using the combination of the polyurethane inner shoe which allows air in and odors escape. Fitting the skate properly to ones foot is very important, a loose skate is a dangerous skate not allowing the user the control and confidence needed to skate properly, a tight skate can cause discomfort and long term damage to ones feet and also become a focus of

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2. The second part of the report deals with the specific results of the work. It is divided into three main sections: the first section deals with the results of the work in the field of agriculture, the second section deals with the results of the work in the field of industry, and the third section deals with the results of the work in the field of commerce.

3. The third part of the report deals with the financial results of the work. It is divided into two main sections: the first section deals with the income of the work, and the second section deals with the expenditure of the work.

4. The fourth part of the report deals with the general conclusions of the work. It is divided into two main sections: the first section deals with the general conclusions of the work, and the second section deals with the specific conclusions of the work.

5. The fifth part of the report deals with the recommendations of the work. It is divided into two main sections: the first section deals with the general recommendations of the work, and the second section deals with the specific recommendations of the work.

their attention dominating their minds and taking from the task in hand, to skate efficiently and safely. To increase the ease of fitting of the shoe a buckle closure system is implemented which eliminates the need for laces and allows a person use the whole length of the boot to fit in their foot rather than opening/loosening the top laces and forcing your foot into the rest of the shoe and tightening and adjusting laces to make it fit. Shock absorption is of huge importance and is a huge plus in in-line skating. While the repeated shock absorption through the foot when running or even roller skating on quads (the older arrangement of wheels) can and has caused damage to participants which basically cripple them from participating within their sport over a period of time due to the development of arthritis, knee injuries early on in their life. The in-line skate eliminates these injuries mainly due to its wheel arrangement (one line) which allows the whole boot remain on the ground longer reducing and almost eliminating shock absorption. The use of lightweight materials means while the structure fits snugly on the foot it is not too heavy to cause an unnecessary weight upon the foot and a drag that would make skating more a task than a pleasure. Growth is a major consideration when designing and tackling ergonomic constraints. In-line skates are very expensive if you are buying proper ones that will function and support your foot adequately. The younger users which count for nearly 50% of all users feet are still growing so paying out huge sums of money on something that parents that may consider a fad is not an adequate proposition (Anon. 1996a, p. 134). Its also not satisfactory to have a junior using a shoe that's too small, that their going to keep and

force themselves into when its too small for them causing long term damage, the result is the Xtena-blade(Fig. 11) from Rollerblade. The Xten-blade is a revolutionary children's skate that adjusts to four full sizes, providing a precise fit for growing feet. This entire toe area of the lower

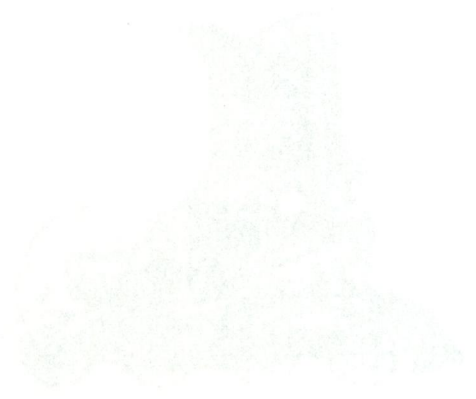


Toe area slides forward.

Figure 11 The Xtenablade

boot slides forward to expand the shell. The toe of the liner is made of a four way stretch material to grow as the shell expands. There are three models which cover overlapping sizes and go from 12 (junior) to six. As a consequence modeling of the skates is on the whole defined by ergonomic restraints. Consequently the character of the product springs directly from its formal and graphic design, particularly of its body apparatus necessary for correct ventilation of the foot. Such restrictions and ergonomic restraints have had to offer new features to accommodate everyone. Energise strive technology (EST) was one such innovation. EST is based on an elastomeric material (form of plastic) that stretches and contracts as you flex your skate; EST harnesses and releases your skating energy giving you increased stability and a better support structure around your ankle and the rest of the foot, increased power for greater

1. The first part of the report is a summary of the work done during the year. It is a brief statement of the results of the work, and is intended to give a general idea of the progress made.



2. The second part of the report is a detailed account of the work done during the year. It is a more extensive statement of the results of the work, and is intended to give a more complete picture of the progress made.

3. The third part of the report is a summary of the work done during the year. It is a brief statement of the results of the work, and is intended to give a general idea of the progress made.

4. The fourth part of the report is a detailed account of the work done during the year. It is a more extensive statement of the results of the work, and is intended to give a more complete picture of the progress made.

5. The fifth part of the report is a summary of the work done during the year. It is a brief statement of the results of the work, and is intended to give a general idea of the progress made.

6. The sixth part of the report is a detailed account of the work done during the year. It is a more extensive statement of the results of the work, and is intended to give a more complete picture of the progress made.

7. The seventh part of the report is a summary of the work done during the year. It is a brief statement of the results of the work, and is intended to give a general idea of the progress made.

8. The eighth part of the report is a detailed account of the work done during the year. It is a more extensive statement of the results of the work, and is intended to give a more complete picture of the progress made.

9. The ninth part of the report is a summary of the work done during the year. It is a brief statement of the results of the work, and is intended to give a general idea of the progress made.

10. The tenth part of the report is a detailed account of the work done during the year. It is a more extensive statement of the results of the work, and is intended to give a more complete picture of the progress made.

speed, greater efficiency for reduced fatigue, more stability for better control and a smoother ride on rough surface. (Internet, 1997, <http://www.rollerblade.com/innovations>)

5.0 Market Influence

Marketing and advertising today have become so much a part of industrial society that even the average person, unconnected with the discipline, understands its basic precepts, using such terms as upmarket, down market, middle market, niche market etc. Selling varies in different places, increased access to the findings of market research is a powerful influence today. More impact has marketing had on design than new technologies and markets. Where once companies sold products that were ends in themselves, now they want to sell systems, concepts, lifestyle choices. By targeting the mass market channels and selling at affordable prices a product can be very successful. Today products are not sold as a unit but as part of a concept consisting of extras such as clothing, glasses, socks, protective gear all spin offs from the initial success. New innovations must be advertised and marketed quickly in order to stay a step in front of the competitor. The world wide success of Rollerblade is nearly all due to marketing and in particular to one woman employed by rollerblade at a time when skates were not making a dent in the market and only being used as a training tool. Mary Horwath transformed the withering concept of roller skating into a pastime / sport that has risen to become a sensation in just a few years. Horwath began by giving them to people that appeared on television, on magazines, quite regularly basically to anyone with a high profile, cyclists, skiers, runners, walkers, football players, journalists and celebrities, anyone that could entice and pass the word onto others. She used them to portray a youthful fast type of living, on advertisements. She set up areas of high profile where there

was a lot of public and passerby's and allowed them try the skates for free. The skates appeared at large profile events, marathons, and at fitness demonstrations. Producing videos and handing out booklets were incorporated to further entice the sport. She set up a group of interested skaters and called them Team Rollerblade and along beach shops revealed the skates. Howarth explored the image and compared their image to the skate pre-ice look being very glamorous and last with this she began to break the ice and succeed in creating a market that always exists. (Powell, 1993, p. 153)

"She hit pay dirt with a lucrative market that has always existed for a stylish roller-skating reincarnation - even when the word roller is purposely avoided. One of the hot ads designed under her supervision read: 'It's kinda like running a marathon. It's kinda like eating a lot fudge sundae. Rollerblade?' (Powell, 1993, p154)

When interviewed about her success in working Woman Magazine she had the following to say:

'I redesigned our displays and packaging so that the product virtually screamed "FUN"!

The company now began to feel success and went from having just sixteen employees and annual sales of less than 3 million to a company whose sales soared to over \$100 million, representing a 70 percent share of the market, fought over by no less than 30 competitors all manufacturing a version of in lines. "According to the National Goods Association, the number of recreational skaters on in-lines nearly quadrupled over a three

year period - from 3.6 million in 1990 to 12.4 million in 1993 and from 92-95. Sales of skates have increased 184%. Looking at the market now the best selling play of all was in the name itself Rollerblade. Although a brand name it has risen to been used as a product as well in a similar fashion that the Hoover did. Skaters throughout the world use it to describe the sport, regardless of make of brand. The design of the boots themselves are very up to date and when compared to the idea that everyone bears within that subconscious of roller skating, heavy clinky metal with wheels and straps attached the in-line skating appears futuristic. By targeting her product at non traditional roller skating types, Horwath helped established a distinctive image that set them apart and above conventional skates. Speed racing now became televised with trick shows running alongside them as a spin off. People saw team 7 eleven a Reebok cycling team training on in-lines, people began to become curious and wonder what the attraction was and they themselves took to the streets to discover the unknown. The market for in-line skates shows great variation between the type of product used, the place where it is used and the use to which the skates are put. America leads the way in the world of in-line skating and serves as a tutor to the rest of the world as to the capabilities of in-line skates. The in-line companies have opened different market segments which are categorized according to their activity, recreation, fitness, aggressive etc. (Powell, 1993, p. 156-157)

America exists in a land dominated by advertising, where televised sports and TV programmes are all scheduled around advertisements. One

central role of sports in America is to create huge advertising space and TV time so that companies can promote and persuade the viewers to buy their product. Sponsorship answers the question as to why some sports are more televised than others, which involves less to do with the visuals and more to do with the financials. This is one of the fundamental reasons why soccer is not big in America, low scoring, no advertisement breaks and why in-line skating is becoming so popular. It fits conveniently into the world of marketing and advertising because it is a new sport and as yet has not set down in black and white the fundamental rules involved. This allows the marketing and advertising experts zone in on the various aspects of in-line skating and shrivel up the events and allow advertising take over, turning it into a carnival of commercialism which has become a focus of most American sports.(Superbowl time being 44% advertising), (Twitchell, 1995, p. 137-141)

5.1 Communication.

As mentioned previously in-line skating in America consists of various segments each acquiring different forms and using new technologies to express the aesthetic that will attract the identified market. The use of colour can be used to dictate the market and can transform the same product into a totally different visual expression. The in line skates express the user's requirements and activities. The skates can be identified with related areas in the market using forms and materials that are common to other equipment in this segment. An intended users purchase will depend on their level of interest, budget and desire to have a stylish and functional looking skate. The first requirement of the in -line

skate that is common regardless of category is comfort. Areas such as cushioning and traction need huge consideration before the aesthetic of the boot can be achieved. The foot must fit snugly into the shoe to allow cushioning and traction achieve the best results, a shoe of the wrong size will cause discomfort regardless of new innovations and technologies that have been introduced. A poor fit will cause cramps, blisters and stability loss, it is for this reason that uppers are used in all the skates and especially in competitive skates which serve to prevent heel drift and movement of the foot and protection from ankle sprain and other injuries. All the above results/requirements must be achieved while keeping weight to a minimum and target its correct market which is communicated to us in different ways.

Racing boots(Fig.12) in in-line skates consist invariably of five wheels and a longer chases for greater stability at high speeds and allows for easier

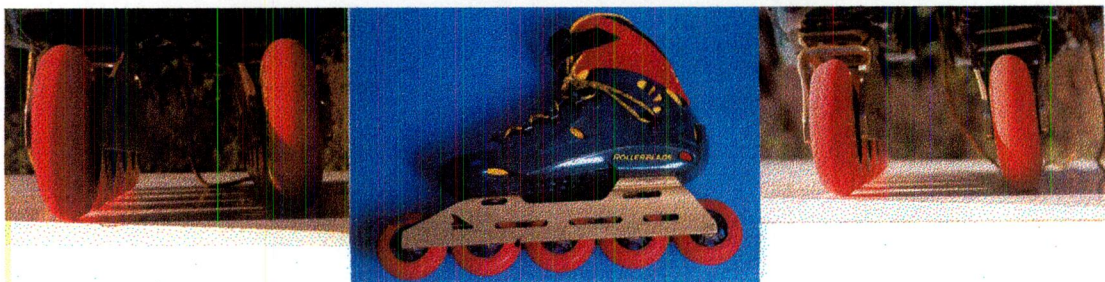


Figure 12 Racing boot

control. The skates are also distinguished through a more pointed toe when compared to the rest of the market, the pointed toe keeps the toes of the feet closer together and makes the skate more aerodynamic. The Rollerblade Power is a good example of a racing skate with an outer shell

being manufactured in plastic to allow for total protection against the implications of rain i.e. a sudden increase in weight. A lightweight product in racing is a superior product in racing and is a huge factor when purchasing a skate. Brakes in racing skates are most of the time non existent and if they do exist they are always removable as are wheels which are larger than normal wheels and lighter concentrating totally on speed.

Roller hockey skates forms and structures have a very close association with ice-hockey skates many features following the same pattern. Roller



Figure 13 CCM hockey boot

hockey skates still use a lace system as opposed to the buckle closure

system that the rest of in-line skates adopt and are usually fabricated in leather. Features such as these make them more readily recognizable to the intended market(off season ice hockey players) and allows the user integrate with the skates aesthetic easily. Having laces instead of the buckle closure system makes fitting the boots more difficult and too much strain on the lace holes can cause tearing and ripping which over time effects the overall structure of the boot. The toe of the boot takes a more rounded approach allowing greater movement of the feet which allows for a greater increase in speed over short distances. The CCM skating boot by Hockey Company(Fig. 13) is one of the leading roller hockey skates on the market.

Aggressive skates(Fig. 14) consist of a molded plastic exterior with cut away vents for air circulation. This type of skate requires a system for an

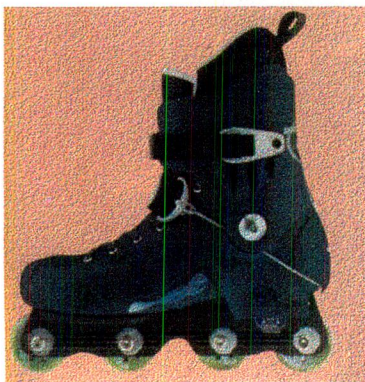


Figure 14 Daytona aggressive skate

easy changeable chases and wheels as the skates are abused and pushed to their limits on every occasion of use. Cushioning and all round protection of the foot is a very important feature, most skates consisting of reinforced plastic structures and structured foam surrounds around areas of regular

impact such as the heel, the ankle and the arch of the foot as the skates will end up at some stage using the above areas to support the whole body.

Recreation skating is less demanding on the requirements of the skate and allows for more potential in the use of colour and materials to attract the

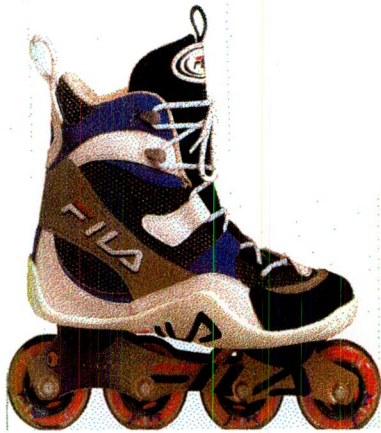


Figure 15 Fila Interval

potential market. The Fila Interval(Fig. 16) is one of the newest recreation skates on the market and is one of the first in-line skates to focus on other modes of persuasion other than technology to sell it. Its a soft boot with black and white with a blue flash, its appearance follows a similar pattern to the exoskeleton structure that some runners have taken concentrating on the use of strong resistive materials around areas of needed support i.e. heel, ankle and toe and using lighter materials to structure the rest of the shoe or leaving them an open area. The wheels of recreation skates are usually smaller which enhance stability and allow for easier turning in the skate. Recreation skates are now beginning to become more and more similar in appearance and structure to runners and now implement a system as in aggressive skates where you can remove the chases making everywhere accessible to the user.

Cross country was not something one would have associated with in-line skating but the designers at rollerblade saw a market and proceeded to produce a product to target this market, the result The Coyote(Fig. 16). The skate is the latest innovation from rollerblade an all-terrain off road skate, it borrows features from original in-line skates from mountain bike



Figure 16 The Coyote

technology and hiking boots because number one they had to in order to achieve their goal and secondly so the skate could target its potential market, using an aesthetic already familiar to cross country enthusiasts. They opted for a much taller duralite aluminum unit to allow for the six inch air filled pneumatic tyres, these wheels work like a mountain bike tyre absorbing shocks that an off road environment provides. It has a unique feature for braking which consists of a cuff activated system with a special drum which is lowered between the back two wheels allowing the user control their speed. The above brands of skates and others of a similar nature have managed to produce the appropriate markets for their use and spread the skates over a range of users. (Collins, 1997, p. 78)



Aggressive skating can and is done everywhere from parks to beach fronts. Aggressive skating is deliberate and is an extremely entertaining misuse of the physical urban landscaping(Fig. 17) in every city, it thrives on such violation of established conventions. Jumping garbage cans curbs and benches pushing each other to learn and try new stunts.

“Although the city’s pace and density can be intimidating true New Yorkers thrive on this intensity ‘Either you feed off of New York’ says photographer Taku Tiara of the cities frenzied energy ‘or it feeds off you.’(Berman, 1997, p. 39)

It is due to the lack of skating arenas and general facilities that has spawned this sport with its hard-core vibe that makes street skating a

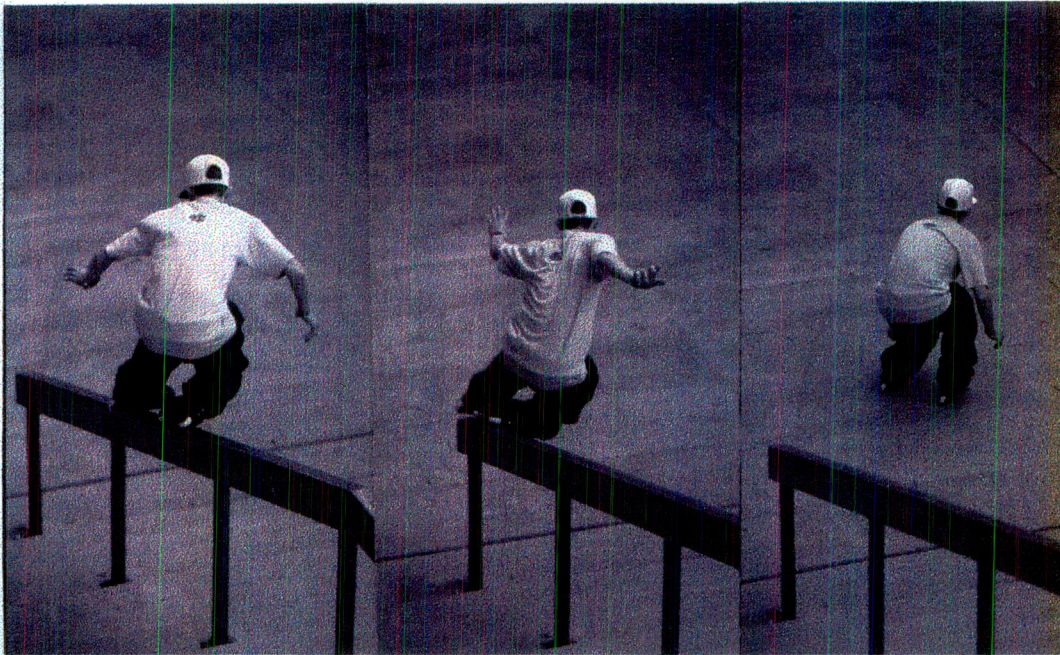


Figure 17 Aggressive skating “railing”

performance event. Aggressive skating always has an element of danger involved with it and its seen as an adrenaline rush, skaters get in the flow

of traffic, own and dominate their space, and give off an aggressive vibe. For aggressive skating there are some fundamental requirements, skates wheels and protective gear must be extra heavy duty to withstand the rigours of aggressive skating. Some street skaters specifically modify that equipment for rail sliding grinding or ramp skating. Because of its unorthodox methods which often are spectacular, aggressive skating receives much media attraction and has impacted fashion and music tracks amongst its practitioners.

Recreation - represents a vast majority of in-line participants recreation skaters frequently share pathways with joggers or bicyclists, so observing rules of the road are particularly important. Recreation skaters participate for fun and share enjoyment, they can be seen cruising along beach fronts, usually clothing is very minimal displaying perfect bodies, recreational skaters see themselves assuming model status putting themselves on display to the public. Equipment usually is quite minimal usually consisting of just the skates themselves. Recreational skates provide the versatility to skate in many different fashions. A quality pair of recreational skates combines a stiff outer shell and comfortable inner liner with good wheels and bearings.

Racing - In-line racers(Fig. 18) usually skate on five wheels, as with any other racing sport it requires good stamina and endurance. As in cycling advanced racers work in teams and implement cunning race strategies which require a high degree of proficiency. There is an on-going

advancement in this area to design and build lighter, stiffer and faster racing skates. The most obvious difference is a frame length of 13 to 15 inches, which allows the addition of an extra wheel. The longer frame



Figure 18 Coventry marathon 1997

provides a more stable and directed stroke and glide but it restricts the turning radius of the skater. The frame is made of a very stiff but lightweight material such as aluminum or titanium. Fitness skates would also fall into this category, skaters skate for fitness in a variety of ways. Interval training, long distance, sprints, skate to ski and even hill climbing are all part of a good cardiovascular in line fitness program.

Children's - the children's market is huge and are basically sold as

recreation skates as a fun activity to introduce children into the world of in-line skating and hopefully be a starting point as opposed to a finishing point. The Xxtena-blade as already mentioned is a perfect example of such a skate.

5.2 Europe.

While the above outlines the progress in America, in-line skating is not having the same impact within most of Europe. While England, Germany and France have in the last two years begun to follow the in-line trend and are competing in racing and aggressive competitions with American counterparts, the market is represented by these Europeans and it is the influence from America that has become evident in the equipment used and the image portrayed by the European counterparts. The recreation market is very different to that of the Americans. In America as previously mentioned the recreation market consists of people positioning themselves on a catwalk assuming model status where as in other countries the market for recreation skating does not exist partly due to the lack of good weather and long popular beach fronts that exist all year round in America which is the attraction of recreation skating and the market it opens. While in England, Germany and France aggressive skating, racing and roller hockey markets exist and are run under organized clubs in conjunction with clubs in America the rest of Europe still sees in-line skating as a kids game, a toy to pre occupy children's minds. It is still associated with and considered to be a glorified roller-skate and has not achieved the market it deserves as a sport, a fitness tool that America has achieved. While the children and some adults of the

1. The first part of the report is a general introduction to the subject.

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3. The third part is a discussion of the results obtained.

4. The fourth part is a conclusion and a list of references.

5. The fifth part is a summary of the main points.

6. The sixth part is a list of the names of the authors.

7. The seventh part is a list of the titles of the papers.

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10. The tenth part is a list of the names of the reviewers.

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16. The sixteenth part is a list of the names of the dealers.

17. The seventeenth part is a list of the names of the wholesalers.

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24. The twenty-fourth part is a list of the names of the distributors.

25. The twenty-fifth part is a list of the names of the agents.

European countries play roller hockey, race on in-lines and attempt other forms of skating their awareness of different boots and equipment is minimal. So while there does exist a market in most European countries it is a more general one with none of the drive and enthusiasm that's put into the marketing and advertising of the product in America to increase awareness. The product is targeted in a more general fashion allowing people take their own interpretation. To compare it with other sports in-line skating has been introduced and marketed in a similar fashion to baseball and American football where it becomes a true American sport, a lifestyle run with all the associated marketing and advertising ploys. There is a small percentage of this advertising that overflows into countries such as Ireland around big events and introduces the unknown which becomes a fad for the younger market in Europe who go through the phase of taking it up and grow out of it as easily as they started.

5.3 Street Culture.

Today the big appeal that sells in-line skates is the need to be in the style and express a trend which is a part to their life. Marketing and advertising play an important role today in its influence on fashion, where the media have realised the transition that adolescents have gone through over the decades and today have increased 'spending power' and their ability to define, decide their own trends and images. Today a style tribe is not considered to be a group of people with all the same origins and traditions, such as the inhabitants of Papua New Guinea were/are, but can be and often are a small group projected across a neighbourhood and

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presented to the world through media circulation and advertising until everyone is aware of their dress code and if they find this attractive or appealing to them can join simply by dressing or fixing their hair or make-up in a similar way.

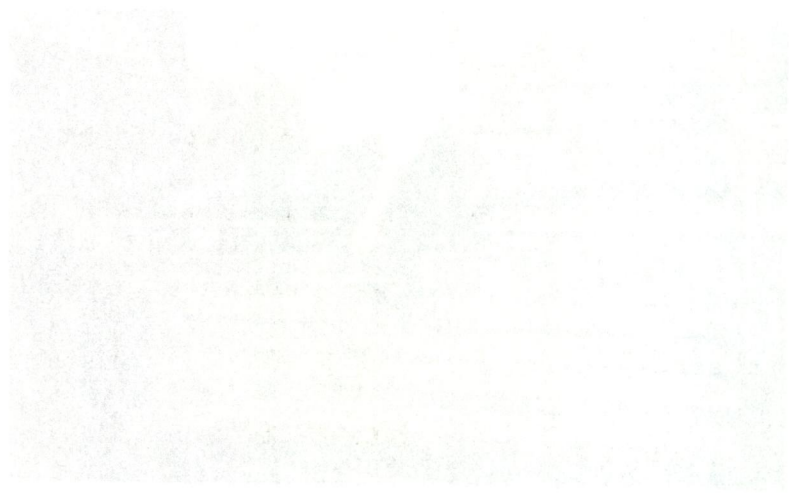
The surfers were another tribe of the time who took a sport and turned it into a way of life that had an influence on millions of non-surfers who wanted to be associated with the carefree and the casual. Skaters are often compared to and associated as part of the surfing tribe due to their similar attitudes and dress sense. Skaters became a tribe in their own right because of their aggressive nature on the streets, causing distress to the public who now need to attain super sensory skills to avoid the oncoming skaters(Fig. 19) and reach their destination. Due to the public's complaints



Figure 19 Utilisation of the street furniture

restrictions have been put on aggressive skaters forcing them out of their public showrooms to desolate areas where they become outsiders and now when they attempt to use the street furniture to do tricks upon they are moved on by police or fined which has fostered an attitude amongst

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It discusses the importance of the study and
the objectives of the research.



segments of skaters which is not too different from those that were kick-started by the bikers, those notions of alternative's and badness which have become a regular injection into streetstyle. (Polhemus, 1994a, p. 48-49)

Skaters can now be seen aggressively skating down pathways, jumping bins, "rolling railings" dominating a space on the road letting loose their angers and forming their own style tribe. In Dublin and other major cities in Ireland in-line skating has not taken to the streets in the fast and growing popularity that it has done in other countries such as England, France, Germany and America where it has its different categories and organisations that arrange competitions for each segment of the sport. In Dublin it is mostly the younger teenage groups and juveniles of urban working class backgrounds that have taken the blades to the streets and adopted them as a tool for releasing aggression and inflicting damage. These young gangs in Dublin travel in groups of five to ten and dominate the footpaths. Their dress code usually consists of anything from school uniforms to jeans, jumpers and tracksuits so their only possible association as a tribe or gang is their age their blades and their consistency to dominate the footpaths. This has led to the public to using other methods of prevention such as a form of speed barrier on places that would entice potential users to cause potential damage. The civic offices in Dublin is one such example who have used metal inserts along low walls to prevent the attraction to potential skaters. While this is the case of the Dublin gangs who seem unconscious of the potential use of in-line skates and the

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The sixteenth part of the report is devoted to a detailed analysis of the tables.

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The twenty-eighth part of the report is devoted to a detailed analysis of the diagrams.

use the rest of the world are putting them to. In the other countries their are aggressive skaters who dominate the pathways their is a sense of meaning to their activities, a sense of organisation, they see it as an art form and there choice in clothes reflects this choosing comfortable, slick performance wear for the "urban jungle"

"loose attitude, loose lifestyle, loose gear." (Polhemus, 1994b, p. 46)

Their choice in clothing is a distinct reaction to that of the despised rollerskaters and other in-line skaters who wear typically tight fitting lycra "disco" styles and it is the surfers attitude and image of baggy wear that is a sure way of proclaiming their distinction from them. Their image exhibits a trend in street style, dressing down, while the clothes they wear are all popular brands amongst the surfer, skater contingent they apply them to portray a rough cut image which is casual and carefree and look as if the clothing was the first item they picked up in the morning. Where as in the forties and fifties people looked to imitate the rich and portray the attitude "I've made it" (zoot suits) now people look to the streets to see what's in. (Polhemus, 1994a, p. 17)

Today in-line skates are sold at high prices, it is rare today to see the old roller-skate which once dominated the disco scene of the late seventies and early eighties. Big brand names now dominate the market such as Rollerblade, Fila, Nike and are being sold at high prices. Skates are now specifically engineered for the many physical activities enjoyed by millions of adrenaline junkies and the health conscious, paying huge

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It also includes a list of references and
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It also includes a list of references and
an appendix of additional data.

5. The fifth part of the report is a
conclusion and a summary of the findings.
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prices for the advanced technology and fashion. People have now become walking mannequins advertising top brands and attracting the attention of the public promoting big brand names. Clothes speak they give off that all important first impression and exhibit the basic human need for personal expression, fashion becomes an extension of ones personality. The expression of the individual is also expressed by the world he or she lives in. Fashion sometimes mirrors other trends in society such as the aggressive skaters modelling themselves on surfers, roller hockey having a very strong association with ice hockey and skiing exhibiting similar choice in clothing, the strong robust aesthetic. Accessories such as glasses have now also broken their way onto the market making a person appear more aerodynamic, futuristic exhibiting a mysterious sense something that has not yet been uncovered. The skaters taking the opposite approach to that of the aggressive skaters looking more organised, efficient, aerodynamic portraying an element of speed with their lycra and the newest innovations in helmet aerodynamics. Fashion sells moods as well as merchandise and it is often the high profiled professional that appears regularly on T.V. in magazines that is implemented to sell these moods. It is the consumer that decides which trends will make it by a process of selectivity in value, quality and utilisation. Today a person is presented with a choice of looks and it is the personal taste of the consumer that succeeds. Once fashion was a constraint a need to conform, today our increased need for freedom of choice enables us to use fashion for self expression, a need for identification which is evident amongst many skaters. It is an era where fashion concepts are presented to you and you

are free to pick, choose and create a concept, a mood in the huge supermarket of fashion that expresses your inner thoughts and wants.

Fashion in other words has become a catch all term for anything to do with the body, its adornment and covering a style, dress, costume that in the end has no distinctive meaning at all. Its too fast changing and loosely structured to qualify as a tribe in any true sense and can be considered a mix with the new and the old randomly selected by what an individual thinks would be good for them. (Polhemus, 1994, p. 131)

Conclusion

The progression of skates today is a reflection on how society is constantly changing and how in order to target markets, companies and designers need to be aware of the whole process involved in taking a product from paper to the hands of the intended user. Product design does not involve new inventions but rather taking an existing product and reproducing it using new approaches. Modern materials, colour, looking at the effect or impact the original product had on society be it negative or positive are taken and used by the designer to influence the products future design. The designer plays a significant part in this process using research results as an indication of the requirements of the product he/she is designing. As a single process product design would find it difficult to exist. Manufacturers and designers need the use of advertising and marketing today to allow their products have an overall effect and target their identified market. If product design was left as an individual process skates would still be considered a toy throughout the world and many more products would be obsolete. Due to good marketing and advertising techniques and a well designed product in-line skates have had a huge impact in America and some European countries, identifying markets that always existed through good design and promotion. Due to lack of advertising and marketing in other European countries such as Ireland the product is still associated as a fad and at present does not look like changing.

Bibliography

Primary Source

O' NEILL, Maureen, Market Research Dept. Rollerblade, Inc. Minnetonka.

ZAIDMAN, Michael, Director & Curator of the National Museum of Roller Skating, Lincoln, Nebraska.

Books

ANTONELLI, Paolo, Mutant Materials in Contemporary Design, New York, Department of Publications, 1995.

BUSCH, Akiko, Product Design, New York, B. Martin Pederson, 1984.

CAM, Millar, In Line Skating Basics, New York, Sterling, 1996.

DE NOBLET, Jocelyn, Industrial Design Reflection of a Century, Paris, Flammarion, 1993.

DORMER, Peter, Design since 1945, London, Thames & Hudson, 1993.

DORMER, Peter, Dictionary of 20th Centuries Designers, Great Britain, Quarto Publishing, 1991.

FEDEL, Frank, Fitness In-Line Skating, Human Kinetics, 1997.

HEELEY, Mark, 1st In Line Roll, New York, Apple, 1996.

PHEASANT, Stephen, Body Space, London, Taylor and Francis Ltd., 1984.

POLHEMUS, Ted, Street Style, London, Thames & Hudson, 1984a.

POLHEMUS, Ted, Style Surfing, London, Thames & Hudson, 1994b.

POWELL, Mark, In Line Skating, Leeds, Human Kinetics, 1993.

TAMBINI, Michael, The Look of the Century, Great Britain, Dorling Kindersley Ltd. 1996.

TWITCHELL, James, ADCULT, New York, Columbia University Press, 1995.

WINTERS, Arthur, Fashion Advertising and Promotion, New York, Fairchild pub. 1984.

Journals

- ANON. "In-Line Skates", Euromonitor, Vol. No. 6, 1996, pp. 127-134.
- ANON. "British In-line Championships", Unity, Vol. 3, 1997, pp. 39-46.
- BERMAN, Josh, "The Empire Strikes" Inline, Vol. 6, 1997, pp.19-24.
- CARR, David, "Roller Blades", Australian Fitness and Training, Vol. No. 5, 1990, p54-56.
- CHALMERS, Aldie, "Free Spirit", Skater, Vol. No. 1, 1997a, pp. 12-16.
- CHALMERS, Aldie, "Raw-Pwer", Skater, Vol. No. 1, 1997b, pp. 19-24.
- HOFFMAN, M, "In-Line Skating", International Journal of Sports, Vol. No. 2, 1992,, pp. 13-20.
- LEVIN, S, "Skating Really", Outside, Vol. No. 1, 1992, pp. 119-121.
- SORENSEN, Barbara, "A Thousand Types of Roller Skates", Museum, Vol. No. 2, 1991, pp. 101-103.
- TUMMINELLI, Palo, "In-Line Skates with ABT brake", Domus, No. 774, 1995, pp.90-93.
- WORDSWORTH, B, "Street Warriors" Skatermag, Vol. No. 2, 1997, pp. 47-56.

Internet

- ROLLERBLADE, <http://www.rollerblade.com>. 1997.
- HISTORY, <http://www.usacrs.com.museum.htm>. 1997.
- INNOVATIONS, <http://www.rollerblade.com.innovations>, 1997.
- HEALTH BENIFITS, <http://www.healthbenifits.com.skating>, 1997.

Non-Published.

- CAHILL, Conor, "The Visual Language of Athletic Footwear, 1996.

