Functional Shoes

The Development of Utility Shoes,[1] Their Differentiation and Interfaces with Fashion

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Two developments in the late 19th and early 20th century appear to have provided an important basis for subsequent designs. In the 19th century, a movement initiated by anatomists resulted in the launch of the *shoe reform*,[2] which aimed to apply ergonomic and orthopedic knowledge to footwear design. This put shoe manufacturing for the first time on an entirely scientific footing. The military made a significant contribution to the practical implementation and international spread of the shoe reform, since good footwear played a critical role in an army's readiness for war. The Swiss army's *Model 1892* was constructed in accordance with the guiding principles of "rational shoe design".

The second crucial development was the *change in shoe usage*. At the beginning of the 20th century, the average inhabitant of the German-speaking world typically owned just one pair of shoes, sometimes with a second for Sunday best.[3] In general, a high premium was placed on the sturdiness of footwear, which wearers expected to be durable and readily reparable. This often meant a mid-calf lace-up boot, worn essentially as all-round or multifunctional footwear. For men, the choice of footwear was likely limited to black lace-up boots [FIG. 1].

During the 1920s, the German-speaking world underwent a massive shift in the most commonly worn type of footwear, with shoes replacing lace-up boots.[4] People increasingly lived in cities where streets were better developed, making it possible to opt for lighter footwear. Whereas there was minimal variation in the choice of lace-up boots (at least in terms of appearance), shoes—particularly for women—quickly evolved into a diverse range of fashionable varieties. However, the fast pace of fashion meant that such shoes were often made to a poorer quality and were also less easy to repair.[5] In general terms, it is possi-

ble to observe the shoe's value in use losing significance in favour of its qualities as a fashion item, while increasing industrialization lowered production costs and allowed rates of shoe consumption to increase many times over.[6]

These near-identical posters, albeit separated by four intervening years, show the transformation of uniform mountain-hiking footwear to a casual shoe that women could pair with increasingly fashionable clothing [FIGS. II, III].

Development and Differentiation of the Practical Utility Shoe

Technological development and new opportunities for leisure activities led to the increasing differentiation of utility footwear, particularly in the realm of sport. This was the period that saw the establishment of sports footwear companies such as Adidas (1924) and Puma (1948); skiing and Alpine tourism became more and more accessible to the mass market,[7] while rubber soles began their onward march to dominance. However, footwear designed for functional purposes remained "for the time being largely unaffected by the trends of fashion".[8]

The *lace-up boot* continued to be the basic design for many types of practical utility footwear [FIG. IV]. It remained the most

[1] Bally poster 1927; Hugo Laubi
(Historical Archives of Bally Schuhfabriken AG)

common variety of everyday footwear until 1920—typically available in brown or black, and boasting a solid and readily repairable construction. Variations existed primarily in the choice of material and type of construction (usually the "Derby" construction,[9] ideally double-stitched).[10] Footwear of this kind was only lightly studded (if at all), and featured at most discreet decorative seams or other forms of subtle ornamentation.

For *work shoes,* there were one or two differentiations in design depending on the practical use they served; generally, however, they were lace-up boots, with shafts that came slightly above ankle-height. The boots were available in black and made using extremely robust material, with construction geared entirely to maximizing longevity. Owners would probably have had to wear in the boot for quite some time until it fitted the foot properly and felt more comfortable. The majority of work boots, depending on their function, would have been studded with a greater or lesser degree of intricacy.

The Swiss army's mid-length lace-up *marching boot*[11] underwent a series of incremental developments of varying scale between 1930 and 1960. One noteworthy example was the introduction of the rubber sole in around 1954.[12] At the same

[II] Bally poster, 1924;
Emil Cardinaux (Historical Archives of Bally Schuhfabriken AG)

[III] Bally poster, 1928;
Emil Cardinaux (Historical Archives of Bally Schuhfabriken AG)

time, shoes with studded leather soles continued to be both produced and worn. This was in part a consequence of the large quantity of stocks still available, although it also provided a way of supporting the shoemaking trade, which was not equipped to manufacture rubber soles and had become increasingly focused on producing boots for officers, who paid out of their own pocket. Difficulties in procuring materials during wartime scarcity meant that the shaft height of the 1941 model was reduced by 1.5 cm.[13] Thanks to its high quality and the policy of providing all soldiers with a free pair, the military boot often made its way into civilian life as work footwear. In contrast to the men's boot, the model worn by the Swiss Women's Auxiliary Service in this period already had a subtly fashionable touch: produced in brown with a red seam, the boot even featured some light padding.

Walking and *climbing boots* are related both in their construction and design to work and marching footwear: lace-up boots with a relatively low shaft, boasting leather lining and felt cloth to prevent the leather from cutting into the foot. Furthermore, they all boast a high-drawn lined tongue, sturdy soles, and resilient material. The more stress the boots were made to withstand, the stronger they became. At *Bally*, "climbing boots had to represent the best in comfort, water resistance, and fit".[14] The most obvious differentiating feature of these various boots was usually their soles or the formation of their studs. The latter lent the sole both grip and longevity, since it protected the sole leather from wear and, when necessary, could also be replaced.

[IV] Bally lace-up boots between 1920 and 1930 (Historical Archives of Bally Schuhfabriken AG; photo: Manuel Fabritz, © Bally)

Available in a number of shapes and sizes, they varied from the lighter outsoles used for everyday footwear, to the sturdier varieties typical of work shoes, and the heavy outsoles fitted onto mountain boots [FIG. v].

Alpine expeditions require boot soles to have excellent traction in order to give wearers enhanced protection from slipping. To achieve this, studdings such as the *Grenacher* and *Bernina,*[15] then subsequently the *Tricouni,* were developed.[16] The latter was created in around 1912 by a Geneva jeweller and passionate mountain climber, and is still produced today in Bulle, Switzerland. The studding gave wearers excellent footing, although the metal plates at the heel in particular acted as cold conductors. For this reason, *Bally* experimented with vulcanized *Sparta* rubber soles for its Alpine climbing boots. These responded exceptionally well to the challenges they were put through, including the need to remain reliably waterproof. However, the greatest advantage was that the same boot was suited to both the approaches and ascents that characterize mountaineering climbs.[17] *Bally* provided the equipment for a number of expeditions to the Himalayas, most famously for the first ascent of Mount Everest in 1953, for which Tenzing Norgay was supplied with *Bally* reindeer-lined boots (a fact the company continues to publicize to this day). The 1940s and 1950s witnessed the creation of a large number of modifications that anticipated future

[v] Bally climbing boots (Grenacher and Tricouni outsoles on left and right respectively) 1930–40 (Historical Archives of Bally Schuhfabriken AG; photo: Manuel Fabritz, © Bally)

developments, such as better padded climbing boots, lighter-weight hiking boots, and their more distant relatives, après-ski boots.

Climbing and hiking boots also fall into the category of *sports footwear,* a sector that grew with particular dynamism during these decades. An article published in 1928 in *Das Werk* magazine vaunted this development:

> Sports footwear is probably the branch of the large Swiss maker of quality products, the Bally shoe manufacturers, that represents a quintessentially modern creation. Shoes for street and evening wear are developments of pre-existing types of footwear. Sports footwear, by contrast, embodies an avowedly modern concept both in terms of function and design.[18]

Existing footwear was increasingly differentiated while new types were created, including designs for tennis, track and field, ice-skating, ice hockey, soccer—as well as hunting and fishing.

Shoes and Functionality

The concept of the "functionality" of products and their design is subject to constant debate. The term is modified and expanded, then matched to the developments and requirements that emerge out of technological and social change. An understanding of a product's function is today given a fundamentally broad footing and understood as a complex network. It is possible to glean a good insight into changing design criteria over the course of the 20th century by reference to the utility shoe's differentiation and evolution through fashion.

Only limited literature is available on the theme of "functionality and shoes". As Anne Sudrow has written, shoes generally fulfill the following basic requirements:

1. Protection of foot from injury, dirt and cold, heat, and other atmospheric conditions;
2. Providing cover from the "indiscreet gaze"; clothing that functions as a second skin, delineating the body from surrounding space;
3. Decoration and accentuation of body (which is equally fundamental).[19]

As design functions diversified, protection of the foot came increasingly under the aegis of practical considerations. Meanwhile, cover from the "indiscreet gaze", as well as features for decorating and accentuating the foot, became categorized as more emotional functions. Christoph Ebert designates and outlines the factors for assessing sports footwear's functionality by reference to three levels:

1. Basic factors: These encompass functions that result in dissatisfaction when they do not meet the sportsperson's corresponding expectations. If the sportsperson has a positive awareness of them, this still does not lead to satisfaction, but rather to mere "non-dissatisfaction". These minimal requirements thus relate to the sports product's core performances.
2. Performance factors: These relate to functions that can lead both to satisfaction when the customer's expectations are exceeded, and to dissatisfaction when the sportsperson's expectations are not met.
3. Inspirational factors: These relate to functions that result in satisfaction when they are available to the sportsperson, but not necessarily to dissatisfaction when not. Inspirational features are not expected by the sportsperson and therefore serve to heighten the experience of a core performance.[20]

Functionality Using the Example of the Ski Boot

In the following section, I will use the example of the ski boot to undertake a somewhat closer examination of the practical and technical functionality of a type of utility footwear. A brief survey of the history of the ski boot's development shows that skis were not originally viewed as sports equipment, but were instead used for mobility in regions prone to heavy snowfall. It was Alpine ski pioneers who first designed equipment for the rigors of downhill skiing. As a result of the development of *Lilienfeld ski binding*,[21] the ski boot had to be made significantly more rigid in order to benefit from the improved lateral support this innovation provided. Since there were no ski lifts at the turn of the 20th century, the ski boot also had to be suitable for climbing.[22] The climbing boot initially served as the basis for the design, adapted through a variety of reinforcements

and technical refinements: A heightened shaft, an inner shoe, and leather straps improved the boot's support, while special flat rubber soles enhanced its hold on the ski. Padding or inner leather soles measuring up to 2 cm in thickness offered improved comfort and helped protect the wearer from cold; overlapping tongue flaps and the use of treated materials made the boot waterproof. In the early 20th century, however, improvised adjustments continued to be the norm—wearers would strike nails into their mountain and walking boots, for example, as a way of preventing the binding straps from slipping over the heel.[23]

The footwear's development into a genuine ski boot took a while, although the expanding sportswear industry was constantly developing new, technically refined models at a tremendous rate. There soon emerged further differentiations of ski boots, as special models were created specifically for touring, piste, slalom, cross country, and downhill skiing.[24] The growing influence of "taste, fashion, and purchasing power"[25] was an additional driving force behind the increasing range of products.

An item of sports footwear should be constructed in a way that ensures it is equal to the particular demands of the sport, and equipped to deal with whatever "walking, running, stretching, jumping, and sliding movements"[26] the activity entails. For ski boots, the aim is to achieve a unity of foot, boot, and ski; to achieve this, every element must be optimally tailored. The upper leather should be "soft, supple, and waterproof, although at the same time it should also be able to dry as quickly as possible and allow the foot to perspire naturally as it is put through its paces".[27] Calf leather, a rather warm and hardy material, was the preferred choice for the leather lining. The alternative was (cheaper, thinner) goat leather—a less durable material, which heavy perspiration can cause to perish rapidly. During the 1940s, opinions were divided as to whether ski boots should have leather or rubber soles. There were two main types of construction: "screwed and duplicated"[28] by machine, or "double stitched" by craftsmen with some mechanical assistance.[29] The increasing scarcity of leather during the Second World War also influenced the manner in which ski boots were constructed; the shortage led to a ban on "seamless ski boots, straps for the

instep and ankle, and strips of tire material around the top of the boot shaft", with only "material-saving shaft designs" permitted.[30] Nevertheless, Switzerland stood in marked contrast to neighbouring countries for it was at least still able to afford producing ski boots during these years.

Christoph Ebert cites in his study the essential requirements for ensuring the ski boot's practical and technical functionality. These stipulate (among other criteria) that the boot should:

- Facilitate walking
- Provide stability
- Transfer power
- Store warmth
- Repel water
- Enable movement[31]

In principle, many of these requirements also applied to the ski boots from the years around 1930, although they are measured differently today, and manufacturers have new technologies at their disposal. Over the years the ski boot has also become laden with elements designed to appeal to fashion tastes and to hold emotional, aesthetic, and symbolic values.

Fashionable Ski Boots

Although fashion still only wielded minimal influence over utility and sports footwear in the early 20th century, its influence increased considerably over the course of the 1930s and 1940s, and resulted in further differentiation.

In skiing, the rise of fashion trends was played out between "the respective poles of material expediency and social communication".[32] The (earlier) development of everyday footwear from boot to fashionable shoe inevitably spilled over and affected other types of shoe as well. Thanks to the significant growth in tourism (attracting large numbers of visitors from throughout the world), increasing amounts of leisure time, and rising prosperity, skiing developed from a pursuit practiced by men and women in small rural communities to a "lifestyle sport" undertaken as a social experience, for which outward appearances played a more significant role. A press release for

the 1935 *Bally Sports Shoe Exhibition* in Zürich recounts this shift:

The first of the larger sports footwear exhibitions took place in 1919, garnering highly favourable reports in the contemporary press. In the 16 years that have followed, tremendous progress has been made in the production of sports footwear. Since then, sport has conquered significant swathes of everyday life, taking on gigantic proportions in the process. One needs only look to skiing to see this […]. The factory houses a section devoted to […] its sports footwear collection that incorporates not only the latest technical innovations, but also the fashion trends that accompany them to an unprecedented extent. After all, sport nowadays does not just equate to "serious" sporting pursuits in which participants aim to score points, but can also refer to what is known as "fashionable sport". People take up a sport for the simple reason that it is in fashion. While […] for serious sports it is vital to ensure […] a level of quality that is up to the demands […] made by the sport in all circumstances, and to equip the wearer for all technical and weather-related conditions, for people concerned about the more fashion-related elements of the ensemble, it is imperative for the boot to coordinate with the overall outfit.[33]

[VI] Ski shoes, 1930–1950
(Historical Archives of Bally Schuhfabriken AG;
photo: Manuel Fabritz, © Bally)

In the article, Hengartner also stresses how female customers in particular created "significant demand for imaginative tailoring and colourful ski boots". As he goes on to explain, "the beauty and elegance of this ski boot model later gave the impetus for the design and development of the après-ski model, which as we know can be seen being worn not only in winter sports resorts, but in our cities as well".[34] The foreground of a contemporary poster features the brown ski boot model for men, with one black and one multicoloured model for women shown in the background.

There emerged a distinction in ski boots between strictly functional models designed specifically for sport and a more fashionable line. *Bally* released models "both for the lone skier who ventures over canyons, glaciers, and virgin snow at an altitude of more than 3,000 meters, and for the 'ski-bunny' who flounders unsteadily on the arm of her ski instructor, and for whom 'winter sports' mean dancing at the five o'clock social".[35] Accordingly, "the savvy skier wants a fur-lined, hand-stitched waterproof boot equipped with straps for the instep and ankle, and a studded sole. The elegant lady skier, sporting plus fours and a Tyrolean hat, opts for ski boots in white and blue, white and brown, and other such combinations".[36] This marks the construction of unmistakably gendered distinctions: the man as a

[VII] Bally 1938; designer unknown
(Historical Archives of Bally Schuhfabriken AG)

solitary, impassioned, and experienced sportsman; the woman for whom skiing is a merely secondary leisure pursuit, and who sees fashion as her primary concern. A striking aspect is how the ski boot's fashionable elements were often expressed entirely in the details—in the form of a coloured strap, for example. As ever, the focus was directed at creating a serious high-quality boot, although one in which fashionable features helped to make the appearance slightly more relaxed and "accessible" [FIGS. VI, VII].

The Utility Shoe as a Fashionable Consumer Product

While it was possible, as Anne Sudrow has demonstrated, to define the role of the standard shoe in relatively unambiguous terms, the fashion shoe was transformed into "a tool for breaking through old class divisions and a means to achieving multilayered, alternative, and more highly differentiated constructions of identity and social belonging. Standard footwear had historically been viewed as specific to a particular region, nation, or social class, whereas fashion was considered to be cosmopolitan and capable of transcending boundaries".[37] People might show how they belonged to a particular social group by (for example) wearing *golf shoes* or *sports shoes*.

Known as the *Spectator Shoe,* one design signalled through its whiteness (a bold colour choice for men's shoes in this period!) that the wearer did not have to get his feet dirty through work,

[VIII] Golf shoe soles
(Historical Archives of Bally Schuhfabriken AG; photo: Manuel Fabritz, © Bally)

and that his sporty appearance was a reference to the way he chose to tailor his leisure time. The shoe was practically a symbol of the wearer's cosmopolitan spirit and, of course, a sign of belonging to a more prosperous social class characterized by a sharp sense for design. While the need to emphasize social qualities by means of fashionable dress was initially limited to a relatively small social class, it played an increasingly important role among less wealthy sections of the population as well.[38]

Bally described golf shoes [FIG. VIII] in similar terms to those applied to ski boots:

> We draw a distinction between the serious golfer and the amateur lady-golfer, for whom enjoying an aperitif on the club terrace is more important than the game itself. Passionate golfers know that the golf shoe has to be sturdy, strong, and weatherproof. For golf courses in Great Britain and France, where the ground underfoot is often sandy or sparsely covered with grass, the golfer can often make do with footwear on the more fashionable end of the scale. Depending on the terrain, the golfer may opt for rubber or studded leather soles.[39]

A feature in *Das Werk* magazine made the following observations about Swiss sports shoes: "Then there is a category known as *sports loafers*, several models of which have been adapted to serve as practical walking shoes for town, and can also be colour-coordinated with the wearer's outfit."[40] The fashionable

[IX] Bally, sports loafers
(Historical Archives of Bally Schuhfabriken AG; photo: Manuel Fabritz, © Bally)

aspect of these models played a considerably more important role than was the case for pure sports footwear or practical utility shoes, while still offering a high level of protection from the cold and wet [FIG. IX]. Another subcategory was known as the *luxury sports shoe* [FIG. IX], to be worn "while walking the promenade at the spa resort and, if need be, on the golf course"[41]—in this order of priority.

A *sports loafer* can also be frequently spotted on the golf course, a terrain to which its thick, heavily ribbed natural rubber sole is well suited [...] The leather comes in fashionable colors that can be stylishly coordinated with the wearer's clothing. They are donned by gentlemen wearing knickerbocker suits, and can also accessorize the sweater dress or tailored British tweed suit of a lady's sports outfit.[42]

The daring, playful designs of some of the men's sports shoes held in the *Bally* archives from 1930 to 1950 suggest modellers were venturing into uncharted territory and able to give full rein to their imaginations. There were no direct models for them to base their designs on. At the same time, it is also clear that a great deal of skillful craftsmanship and high-quality manufacturing went into these shoes, deviating considerably from the practices of mass production—and adopting an

[x] Bally, sports shoes
(Historical Archives of Bally Schuhfabriken AG; photo: Manuel Fabritz, © Bally)

approach that would be near-impossible to replicate today. In any event, fashion influenced the design of these shoes to what was probably an unprecedented extent. The shoes' penchant for ornate details owed little to the period's avant-garde design trends, which focused on "pure function"—in particular, the degree to which the object's design fitted its purpose. Thus it seems likely that it was sports footwear that paved the way for men to enjoy more colourful and flamboyant shoe fashions. However, my research has been unable to establish for certain whether all these models were indeed produced and released for sale, or whether they were intended more as display models in store windows or as presentation models.

Seen from another perspective, it is interesting to note how elements of practical and technical functionality were transferred to fashion shoes in an extremely aesthetic manner. This is evident, for example, in the diamond-shaped studding on the sole of the shoe shown in the centre, or the quick-release fastener on the shoe to the right of the picture. Thus, practical utility shoes, with their technical details and innovations, in turn lent inspiration to shoe modellers (or designers, as they are known today) for their creations. Nevertheless, it is not always clear whether a design element actually served a functional purpose, or solely as a sign and cultural reference—in other words, was *designed to look functional*. This interplay survives today, or rather, has been intensified to such a considerable degree that the boundary delineating the fashion shoe from the utility one has vanished [FIG. X].

Summary

Practical utility shoes occupy an interesting interface, revealing fundamental questions about the contemporary relationship between design, functionality, and fashion. The relationship effectively maps onto the creative overlap between technical quality, growing demand for fashion, and the economic interests of the shoemaking industry.

For everyday footwear, the shift from boot to shoe—and hence to a process of fashionable individuation and short-lived designs—took place in around 1920. Anne Sudrow has demonstrated that the fundamental transformation was a process that

saw an increasing emphasis on fashionable qualities, and less on footwear's actual value in use. In the following years, this process also took place among less prosperous socio-economic groups, as increased industrialization facilitated the reduction of production costs.[43] It helps to understand this change in parallel with the shift in meaning of the term "functionality" over the course of the 20th century. During this period, the concept underwent a marked shift from a purely technical and practical sense to an increasingly semiotic and symbolic one, which in turn became wedded to fashionable considerations. As a result, criteria that had hitherto played a central role in footwear's value (such as durability and reparability) became less important.

By contrast, functional utility shoes remained (at first) largely immune to fashion's influence. The variety of technical demands put on sports shoes in their respective fields led to innovative developments in soles, materials, and types of construction; one such consequence was the rubber sole's breakthrough into the mass market. Shoe production became increasingly industrialized and more scientific. Between 1930 and 1950, however, fashion did eventually come to play a rapidly increasing role in the design of utility shoes, particularly for sports footwear, albeit often solely in the details. The only exception to this was principally work footwear.

These two factors, technology and fashion, led to unprecedented levels of differentiation in the various types of footwear. How much this genuinely responded to the needs of consumers, and how much it served the shoe industry in its primary quest of increasing sales figures, remains an open question. What is known for certain, however, is that the sports shoe played an important role in the process. It provided a space in which designers were able to pursue technical discoveries and experiments in design, while forging a link between technical, practical-oriented footwear and fashion, something which continues to influence us in the present day.

1 There are no general criteria for defining "utility footwear"; here it serves as an umbrella term for footwear in which the design is geared more towards practical value in use and material suitability than for use as a

statement of fashion and/or social communication—hence it applies primarily to work, military, and sports footwear.

2 Breyer 2012, p. 31.

3 Sudrow 2010, p. 65.

4 Ibid., p. 85.

5 Ibid., p. 85.

6 Ibid., p. 96.

7 Ebert 2010, p. 78.

8 Sudrow 2010, p. 151.

9 The Derby (also known as Molière or Gibson) shoe construction: "This refers to a type of shoe in which the laced section is located above the vamp. The lace can be tightened or loosened to optimize the fit to the wearer's individual instep measurement." (Blatter 2001, II-4-4)

10 Double stitching: "This style probably originated in the Alpine countries. [...] From the 17th century, people began using this method for making sturdy, robust footwear." Typical distinguishing features of this method are the two visible seams: The pierced seam (horizontal) joins the leather upper to the insole rib, the double seam (vertical) joins the leather upper to the mid-sole. (Blatter 2001, VI-3-4)

11 This term refers solely to the Swiss army marching boot (Ordonnanzschuh), as opposed to boots worn by officers or footwear worn by the armed forces of other countries.

12 Laubacher/HAM 2007/13 and Historical Archives of Bally Schuhfabriken AG, Stöckli, around 1970.

13 Historical Archives of Bally Schuhfabriken AG, Stöckli, around 1970.

14 (Das) Werk, 1928/15, p. 21.

15 Grenacher and Bernina refer to types of stud arrangement, each of which uses a different type of hobnail (illustrations of which can be found in: Gleitschutz–Caesar bis zur Himalaya-Expedition, Historical Archives of Bally Schuhfabriken AG, around 1950).

16 Historical Archives of Bally Schuhfabriken AG, Gleitschutz—von Cäsar bis zur Himalaya Expedition, author unknown, around 1950, p. 4.

17 Ibid., p. 5.

18 (Das) Werk, 1928/15, p. 21.

19 See Sudrow 2010, p. 68

20 Ebert 2009, p. 47.

21 The first modern ski binding, late 19th century, invented by the skiing pioneer Mathias Zdarsky.

22 Ebert 2009, pp. 77f.

23 Hengartner 1944, pp. 1f.
24 Ibid., p. 2
25 Ibid., p. 2.
26 Ibid., p. 2.
27 Ibid., p. 2.
28 The sole was fastened with twisted nails (screws), a construction style that was used until recently for military footwear.
29 Hengartner, no date, p. 3.
30 Ibid., p. 6.
31 See Ebert 2009, p. 92.
32 Sudrow 2010, p. 151.
33 Historical Archives of Bally Schuhfabriken AG, Bally Sportausstellung, M.P.F., 1935.
34 Hengartner 1944, p. 3.
35 Historical Archives of Bally Schuhfabriken AG, Bally Sportausstellung, M.P.F., 1935.
36 Ibid.
37 Sudrow 2010, p. 395.
38 Ibid., p. 150.
39 Historical Archives of Bally Schuhfabriken AG, Bally Sportausstellung, M.P.F., 1935.
40 (Das) Werk, 1928/15, p. 21.
41 Ibid., p. 24
42 Ibid., p. 24
43 See Sudrow 2010, pp. 61–96.