

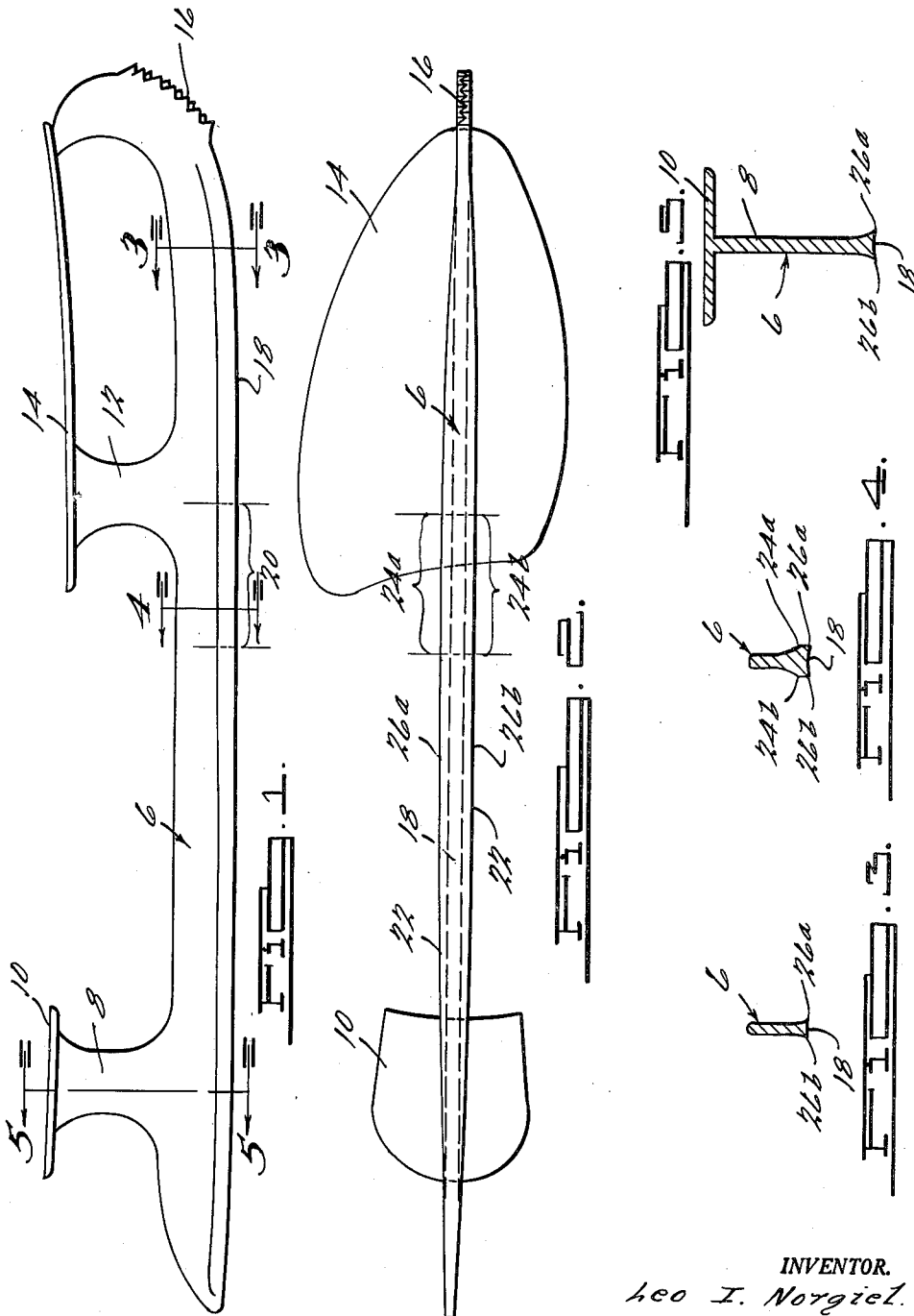
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ICE SKATE BLADE

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1

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ICE SKATE BLADE
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The present invention broadly pertains to ice skate blades, and more particularly, to an improved ice skate blade configuration of the figure skating type that improves the balance of the skater and facilitates the execution of artistic maneuvers on ice.

In modern figure skating, the skater maneuvers through an artistic series of arcuate and spiral patterns in a forward as well as a backward skating position. During these artistic maneuvers, different segments of the blade edges of the skates are employed to cut into and engage the ice maintaining the skater's balance and equilibrium and enabling the execution of the curved patterns of varying radius. For example, during normal skating or skating in relatively large radius curves, the skater's weight is usually concentrated at a point slightly forward of the midpoint of the blade and the blade edges adjacent to this point are primarily utilized to engage the ice. During forward skating through arcuate figures of a relatively small radius, the blade edges along the rearward portion of the blade are primarily utilized to contact the ice whereas the forward edge portions of the blade are primarily employed during the execution of relatively sharp radius figures while skating in a backward position. The sharper the curvature of the figures executed, the closer towards the ends of the blade moves the segment along the edges of the blade contacting the ice. Conversely, the greater the curvature of the figure executed the closer toward the point slightly forward of the midpoint of the blade moves the bearing contact edge.

Figure skate designs heretofore employed have incorporated blade configurations having parallel side edges and having a bottom edge of a substantially constant curvature. Tapered blades have also been proposed incorporating a straight taper which substantially retains the characteristics of the parallel edge skates heretofore mentioned. These skate blade configurations frequently cause excessive grinding and scrubbing of the ice during the execution of artistic patterns.

It is accordingly a primary object of the present invention to provide an improved ice skate blade for figure skating having compound curvature edges extending forwardly and rearwardly from a substantially straight center portion having a simple arcuate curvature and disposed slightly forwardly of the midpoint of the blade, and which edges are adapted to provide the optimum configuration for facilitating the smooth execution of curves of varying radii.

The foregoing and other objects of this invention are achieved by providing the bottom of the blade with a contour characterized by a simple circular arc section disposed slightly forwardly of the midpoint of the blade and which curves upwardly therefrom toward each of the ends of the blade in a smooth parabolic contour of decreasing radius. Additionally, the length of the blade is provided with a symmetrical tapered contour having a thick portion with substantially parallel sides disposed adjacent to the simple arc section along the bottom and tapering therefrom toward each of the ends of the blade in a smooth parabolic contour of decreasing radius.

Other objects and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a side elevation view of a figure skate

2

blade incorporating therein the preferred embodiment of this invention;

FIG. 2 is a bottom plan view of the figure skate blade shown in FIGURE 1;

FIG. 3 is a transverse vertical sectional view through the forward portion of the figure skate blade shown in FIGURE 1, and taken along line 3-3 thereof;

FIG. 4 is a vertical cross-section view through the central portion of the figure skate blade shown in FIGURE 1 and taken along line 4-4 thereof; and

FIG. 5 is a vertical cross-section view through the rearward portion of the figure skate blade shown in FIGURE 1, and taken along line 5-5 thereof.

Referring now in detail to the drawings, the figure skate comprises an elongated blade 6 having a rear support member 8 integrally affixed to and extending upwardly therefrom to the upper end of which a heel mounting plate 10 is rigidly affixed. A central upright support member 12 is integrally affixed to and extends upwardly from the blade 6 at a point slightly forward the midpoint thereof to the upper end of which is affixed a toe mounting plate 14 and having the forward portion thereof supported by the upturned forward end or toe of the blade 6. The forward upturned portion or toe of the blade 6 is provided with a plurality of serrations or teeth 16 for engaging the ice as the skate blade is rocked onto its toe facilitating stopping and the execution of sharp maneuvers.

The bottom surface 18 of the blade 6 is provided with a simple circular arc section generally designated at 20 which is disposed along the blade at a point slightly forward the midpoint thereof. The arcuate section 20 is adapted to correspond with the portion of the blade utilized during the execution of straight or substantially large radius curves. The bottom surface 18 of the blade tapers upwardly from the arcuate section 20 toward the toe and heel portions thereof in a gentle parabolic curve which tangentially intersects the ends of the arcuate section 20 providing a smooth transition from the simple to the compound curved sections of the bottom surface 18 of the blade. The nature of the parabolic curvature is such that segments of an infinitesimal length thereon decrease in radius during movement from the arcuate section 20 toward the toe and heel of the blade. The resultant curvature or rock, as it is usually referred to, of the bottom surface 18 of the blade 6, is one which constantly changes along the forward and rearward portions of the blade separated by the arcuate section 20 which has a constant radius, usually ranging from about 4 to about 10 feet.

In addition to the variable radius rock of the bottom surface of the blade, the side portions 22 of the blade are provided with a corresponding constantly varying curvature comprising substantially flat sections 24a, 24b which are substantially parallel to each other and are longitudinally disposed along the blade adjacent to the arcuate section 20 in the bottom surface 18 of the blade. From the substantially flat side sections 24a, 24b, the blade tapers forwardly and rearwardly in a symmetrical fashion and in a parabolic curvature of decreasing radius toward the toe and heel portions of the blade. The tapered parabolic curvatures of the forward and rear side portions of the blade tangentially intersect the substantially flat side sections 24a, 24b forming a continuous smooth transition of curvature which is substantially infinite at the flat sections 24a, 24b and decreases rapidly as the toe and heel of the blade are approached.

The variation achieved by the compound curvature of the bottom and side surfaces of the blade is illustrated in the cross-sections through the forward, middle and rearward portions of the blade as shown in FIGS. 3-5, respec-

tively. The bottom surface 18 of the blade 6 is preferably provided with a hollow ground concave surface of substantially constant radius which varies in depth along the length of the blade dependent upon the width thereof. The blade edges 26a, 26b created by the intersection of the bottom surface 18 and the side portions 22 of the blade are of a simple arcuate curvature and substantially parallel to each other adjacent the arcuate section 20 and flat sections 24a, 24b and taper therefrom upwardly and inwardly toward the longitudinal center axis of the blade in a three-dimensional curvature toward the toe and heel of the blade in a continuously decreasing radius.

Since the execution of arcuate and spiral patterns is achieved with the blade tilted, only one of the blade edges 26a, 26b contacts the ice during artistic maneuvers. As heretofore mentioned, as the radius of the arc of the maneuver decreases the skater, in order to maintain his equilibrium, causes his weight to shift forwardly or rearwardly along the blade depending on whether he is skating in a forward or backward position, and in so doing, utilizes the portion of the blade edges 26a, 26b which correspondingly decrease in radius. When the skater performs a straight glide or a relatively large radius curve the blades are substantially upright and in which position the parallel portions of the blade edges 26a, 26b contact the ice providing directional stability and enhancing balance. In view of the foregoing it will be apparent that the unique compound curvature configuration of the blade edges 26a, 26b provides the optimum configuration of the contacting portion of the blade edge depending on the severity of curvature of the maneuver executed. The weight shift of the skater during the execution of variable radius maneuvers is automatically compensated for by the variable radius blade edges 26a, 26b providing optimum efficiency in the execution of the artistic maneuvers, and minimizing grinding and scraping of the ice.

The specific skate configuration shown can be varied in width and in length to adapt it to the size and weight of a particular skater. The central portion of the blade corresponding to the arcuate section 20 generally comprises from about 30% to about 50% of the effective length of the blade. The forward tapered portion of the blade between the central portion and the serrations or teeth 16 can vary within a range of from about 20% to about 30% of the effective length of the blade while the rearward tapered portion of the blade extending rearwardly from the central portion can range from about 30% to about 40% of the effective length of the blade. Additionally, the width of the blade at its widest point along the substantially flat parallel side sections 24a, 24b can vary in width to accommodate skaters of varying weight. The tapered toe and heel portions of the blade taper to a width ranging from about 70% to about 90% of the maximum width of the blade. The length of the blade can similarly vary in accordance with the size of the skater retaining the blade proportions hereinabove set forth.

The novel blade configuration herein shown and de-

scribed may be manufactured of the conventional high carbon steels and preferably is comprised of a chromium steel containing from about 16% to about 18% chromium, from about .95% to about 1.20% carbon, up to about .75% molybdenum in addition to small quantities of the conventional impurities. Ice skate blades manufactured of the chromium steel have been found to be particularly satisfactory in providing superior glide characteristics, in retaining extremely sharp edges, and in providing a high luster without the necessity of electrodeposition of a metallic coating thereover such as chromium. This latter factor is particularly advantageous since conventional ice skates produced from ordinary steels will corrode at the bottom surface of the blade which is devoid of a metallic plating after short use causing a roughing of the surface and a dulling of the edges. The chromium steel on the other hand is corrosion resistant and retains a smooth surface and sharp edges over long periods of use and does not corrode in spite of repeated sharpening.

While it will be apparent that the preferred embodiment herein illustrated is well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claim.

What is claimed is:

In a figure skate, the combination comprising an elongated tapered blade having a bottom surface and tapered side surfaces that form at their intersection a pair of arcuate blade edges, said blade including a toe, a heel, and an intermediate portion disposed forwardly of the midpoint of said blade and constituting the widest portion thereof, said blade edges along said intermediate portion disposed substantially parallel to each other and generated by the intersection of substantially straight sections of said side surfaces with a circular arc section of said bottom surface, said side surfaces extending tangentially from said straight sections in parabolic curvature of decreasing radius toward said toe and said heel of said blade, said bottom surface extending tangentially from said simple circular arc section in parabolic curvature of decreasing radius toward said toe and said heel of said blade, said intermediate portion comprising from about 30% to about 50% of the effective length of the blade, and said toe and said heel of said blade having a width ranging from about 70% to about 90% of the width of said intermediate portion.

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