

July 6, 1965

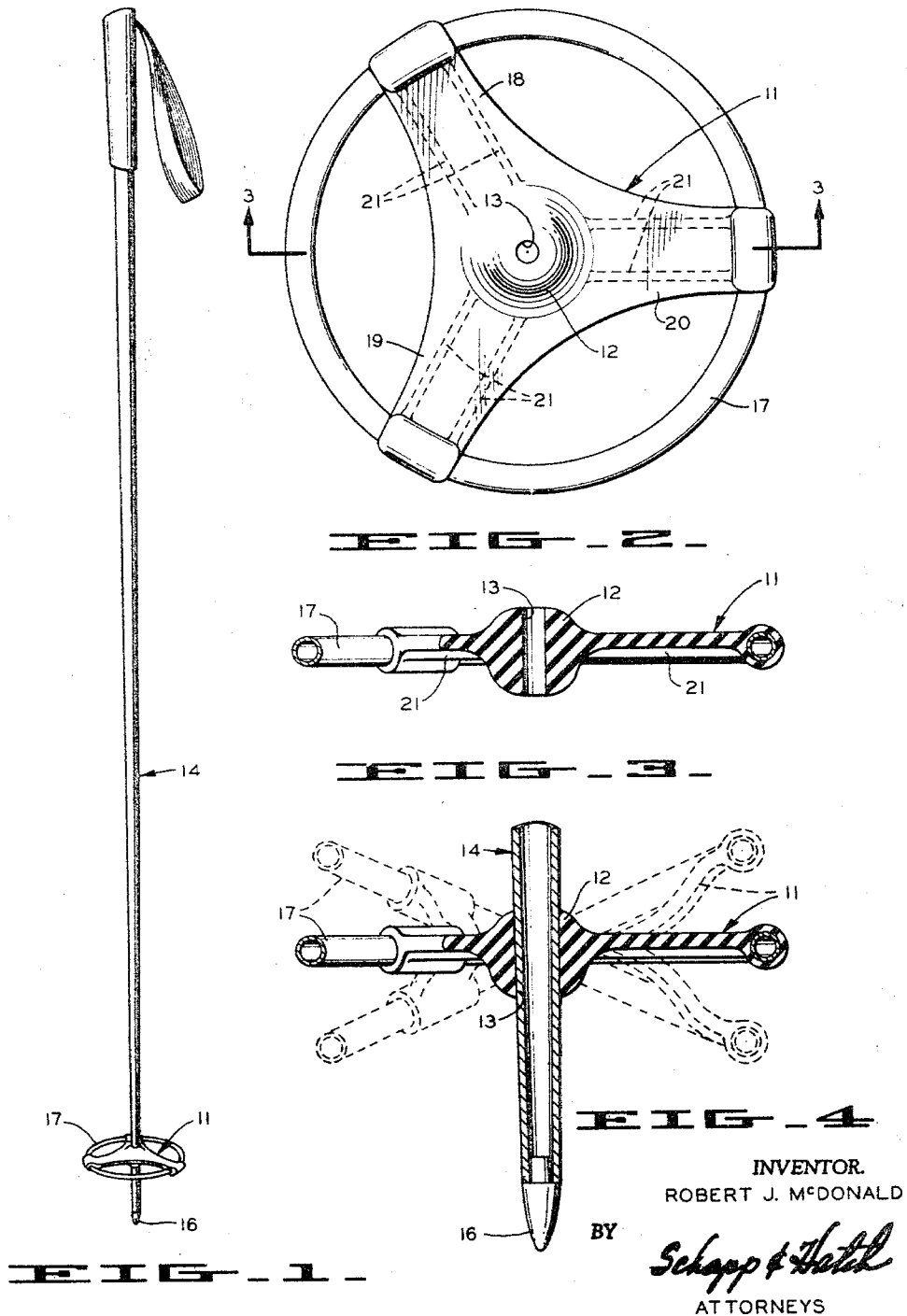
R. J. McDONALD

3,193,300

SKI POLE RINGS

Filed Jan. 25, 1961

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SKI POLE RINGS

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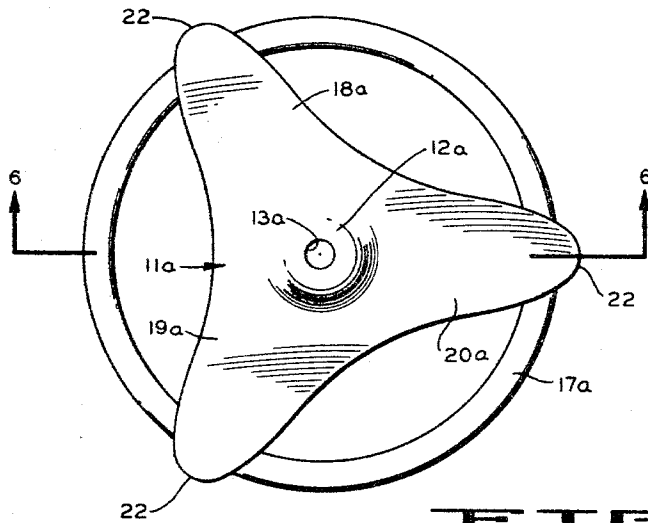


FIG. 5-

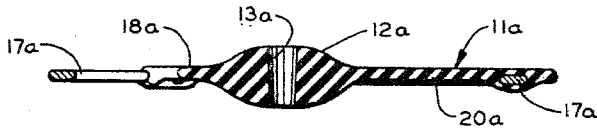


FIG. 6-

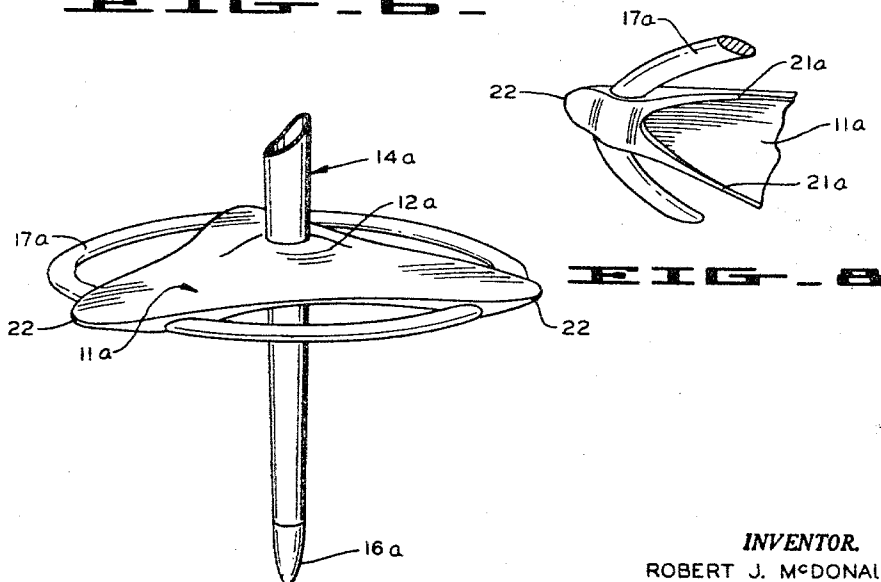


FIG. 7-

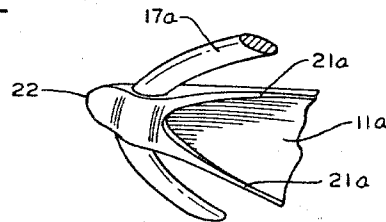


FIG. 8

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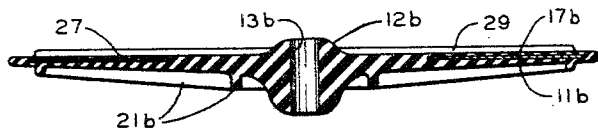


FIG. 10.

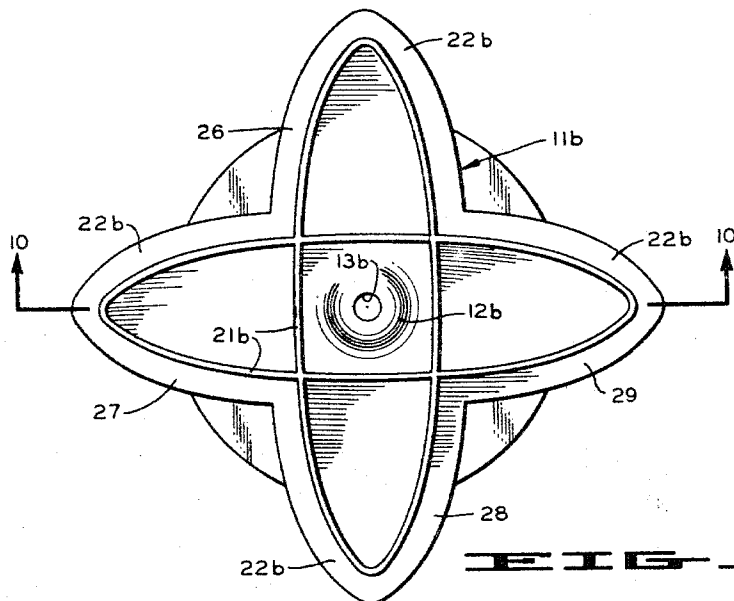


FIG. 9.

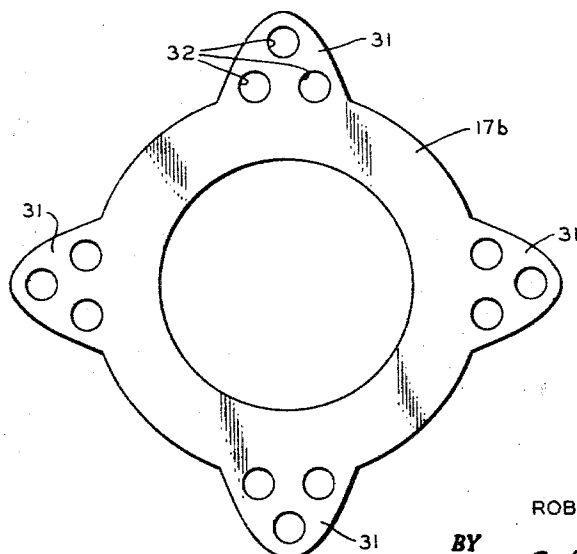


FIG. 11.

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SKI POLE RINGS

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9 Claims. (Cl. 280—11.37)

This invention relates to improvements in ski pole rings and more particularly to rings adapted for detachably gripping the ski pole shaft.

It is extremely important that the lower end of the ski pole, where the snow-engaging ring is mounted, be as light in weight as possible in order to facilitate speedy manipulation of the pole and to avoid tiring the arms of the skier. The conventional ski pole ring consists of a metal ferrule pinned or otherwise secured to the shaft together with a ring secured to the ferrule by lacings or thongs, usually of leather.

This construction is relatively heavy and attempts have been made to lighten the structure and provide a lower moment of inertia by utilizing light-weight metals for the ferrule and ring. This still leaves the leather thongs which are relatively heavy, particularly when wet. Moreover, the conventional rings are difficult to install on the ski pole shaft and are relatively expensive.

Attempts have been made to provide ski pole rings which can be readily mounted on and removed from the ski pole shaft. One such ring provides a rubber bushing which is compressed axially to squeeze the inner periphery thereof into contact with a peripheral groove provided in the ski pole shaft. This structure requires means for compressing the rubber bushing and also requires a specially formed shaft.

Efforts have been made to replace the leather thongs with molded rubber or polyethylene spokes. These structures have not been entirely satisfactory due to failure to recognize the flexure requirements of ski pole rings.

Basically the ring is designed to limit the penetration of the lower end of the ski pole into the snow. Since the shaft of the pole may assume any angle relative to the surface of the snow, the members connecting the periphery of the ring to the pole shaft must flex sufficiently to permit the ring to assume any desired angle relative to the shaft. At the same time the connecting members should support the ring so the plane thereof is perpendicular to the ski pole shaft when not engaged with the snow.

The present invention contemplates a detachable ski pole ring which is inherently capable of overcoming the objections outlined above in a structure much lighter in weight than any ski pole rings heretofore known. This is accomplished by forming the attaching hub integrally with the connecting members and pre-tensioning the latter in a novel manner, resulting in a very light-weight structure having an optimum snow-engaging action.

Accordingly it is a principal object of the present invention to provide a ring for ski poles which is of very light-weight molded construction affording a low moment of inertia so as to permit extremely rapid manipulation of the snow-engaging end of the pole.

Another object of the invention is to provide a ski pole ring of the character described which may be easily and quickly installed by merely forcing the hub onto the ski pole shaft, the hub being designed to securely retain the ring in such position under all conditions of use without requiring additional fastening devices.

A further object of the invention is to provide a molded ski pole ring which affords an improved snow penetration-limiting action in which the ring may readily be deflected to any desired angle relative to the ski pole shaft while at the same time being adapted to snap back automatically to a plane perpendicular to the shaft when lifted from the snow. This flips loose snow from the ring and

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prevents the device from flopping loosely and possibly digging the edge of the ring into the snow.

A still further object of the invention is to provide a light-weight molded ski pole ring which is attractive in appearance, economical to produce, and which provides a long and trouble-free life.

Another object of the invention is to provide a molded snow penetration-limiting device for ski poles adapted for use in areas containing numerous bushes and undergrowth, the device being constructed in such manner as to avoid being caught thereon.

Further objects and advantages of my invention will be apparent as the specification progresses, and the new and useful features of my ski pole rings will be fully defined in the claims attached hereto.

The preferred forms of my invention are illustrated in the accompanying drawings forming part of this application, in which:

FIGURE 1 is a side elevational view of a ski pole having a snow penetration-limiting ring constructed in accordance with the present invention;

FIGURE 2, an enlarged plan view of the ring of FIGURE 1;

FIGURE 3, a cross-sectional view taken substantially on the plane of line 3—3 of FIGURE 2;

FIGURE 4, a cross-sectional view taken similarly to that of FIGURE 3 and illustrating the mounting of the ring on the lower end of a ski pole shaft and the flexing action provided by the ring;

FIGURE 5, an enlarged plan view of a modified form of the ski pole ring of the present invention;

FIGURE 6, a cross-sectional view taken substantially on the plane of line 6—6 of FIGURE 5;

FIGURE 7, a perspective view of the ring of FIGURE 5 mounted on the lower end of the ski pole shaft;

FIGURE 8, a fragmentary perspective view of a portion of the ring of FIGURE 6;

FIGURE 9, a plan view of another form of the ski pole ring of the present invention;

FIGURE 10, a cross-sectional view taken substantially on the plane of line 10—10 of FIGURE 9; and

FIGURE 11, a plan view of a metal annulus forming part of the ring of FIGURE 9.

While I have shown only the preferred forms of my invention, it should be understood that various changes or modifications may be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawings in detail, the ski pole ring of the present invention consists essentially of a flattened member 11 of resilient material having an enlarged hub 12 formed with a central opening 13 adapted for mounting in gripping engagement on a ski pole 14 in spaced relation to the lower end 16 thereof, and an annulus 17 of relatively rigid material secured to the member 11 in concentric relation to hub 12.

As an important feature of the invention, the device may be quickly and easily mounted on the ski pole shaft and will remain in the desired position under varied conditions of use. This is accomplished by making the hub 12 relatively thick and the opening 13 considerably smaller than the diameter of the shaft. The hub is merely forced over the tapered point 16 and up the shaft the required distance. The nature of the resilient material used is such that it will securely grip the shaft 14 and hold the member 11 at the desired location. It should be noted that the central opening 13 extends for a considerable axial distance so as to provide maximum gripping area for frictional engagement between the hub 12 and shaft 14.

The opening 13 is considerably smaller in diameter

than the outside diameter of the shaft 14 with which it is to be engaged. For a shaft having an outside diameter of approximately $\frac{3}{4}$ of an inch the opening 13 would be approximately $\frac{1}{16}$ of an inch. It will be obvious that forcing of the hub 12 onto the shaft 14 will cause the hub to expand and the resilience of the material will force the wall of opening 13 into tightly gripping engagement with the shaft.

I have found that while the opening 13 may be of constant diameter as illustrated in FIGURE 3, an improved gripping action may be obtained by tapering the opening in the manner shown at 13a of FIGURE 6 of the drawings. In this form, the opening 13a tapers down to a smaller diameter at the bottom of hub 12. This makes it easier for the hub to be pushed upwardly onto the pole while at the same time, because of increased gripping action at the lower portion of the hub, removal of the device from the pole will be strongly resisted.

The member 11 is formed to prevent the ring from flopping loosely on the lower end of the ski pole. At the same time the member 11 is flexible enough to allow the ring to rest flat against the snow no matter what angle is assumed by the shaft 14. This is accomplished by pre-tensioning the portion of member 11 between the hub 12 and annulus 17 in a manner insuring that such portion will remain taut when the hub is expanded radially by being mounted on the ski pole.

The pre-tensioning of member 11 is accomplished by using a resilient material which has a controlled rate of shrinkage during the curing operation. I have found that a shrinkage rate of approximately 3% will exert sufficient pre-tensioning force to more than compensate for the expansion of hub 12.

I prefer to form the member 11 from a resilient material having rubber-like characteristics, that is, a material which is resiliently stretchable, tough, resistant to shock and abrasion, and which possesses the property of shrinking during the curing process after the member is molded. Any material possessing these properties will, of course, be suitable.

One such material is a pure gum rubber stock having sufficient hardening agents added thereto to provide a reading of approximately 55 to 70 on the durometer. Suitable conditioning agents and the like may be added to the material, it being kept in mind that the material should be as tough, resilient, and free from weathering effects as possible consonant with the described controlled shrinkage during the curing operation.

The member 11 is preferably formed with a plurality of circumferentially spaced, radially extending flattened arms which are secured to and support the annulus 17 in spaced concentric relation to the hub 12. This structure is admirably suited to molding processes, the arms preferably having their end portions molded in surrounding relation to the annulus and bonded thereto.

In the form of the invention illustrated in FIGURES 1 through 4, three arms 18, 19 and 20 radiate from the hub 12 at 120° intervals. This design permits a minimum amount of the rubber-like material and hence the ring is extremely light in weight, making it possible for the skier to flick the lower end of the ski pole about with great ease and facility.

The light-weight theme is carried out further by providing the annulus 17 in the form of a hollow metal ring which may be made of a light metal alloy. Weight is kept to a minimum by making the arms 18, 19 and 20 as thin as possible. This also promotes the easy flexing characteristics of the arms as depicted in phantom lines in FIGURE 4. Stiffening and strengthening of the arms may be accomplished by forming integral ribs 21 at the points of maximum strain.

FIGURES 5 through 8 of the drawings illustrate a modified form of the invention in which the member 11a is formed with three arms 18a, 19a and 20a which radiate at 120° intervals from a hub 12a. An opening 13a is

formed centrally of the hub 12a for mounting in gripping engagement on a ski pole 14a in spaced relation to the lower end 16a thereof. An annulus 17a of relatively rigid material is secured to the member 11a in concentric relation to the hub 12a.

In this form of the invention the arms 18a, 19a and 20a extend radially past the annulus 17a with each of the arms terminating in a rounded lobe 22 projecting beyond the annulus. Besides providing an attractive appearance, these lobes may afford an improved action in certain types of snow and provide maximum snow-engaging area with a comparatively small and light-weight ring.

I prefer to form stiffening ribs 21a along the edges of the arms 18a, 19a and 20a, these ribs being faired smoothly into the thickened portion of the arms surrounding the annulus 17a in the manner shown in FIGURE 8 of the drawings. In this version of the invention I also prefer to provide the annulus 17a in the form of a flattened metal ring so as to limit the structure to a minimum thickness, see FIGURE 6.

The form of the invention illustrated in FIGURES 9 through 11 of the drawings includes a member 11b having four arms 26, 27, 28 and 29 projecting from the hub 12b in the form of a cross. A central opening 13b is provided in hub 12b for mounting on a ski pole shaft in the manner illustrated in FIGURE 1 of the drawings. In this version, the annulus 17b is formed from very thin spring metal and the member 11b is large enough to cover the entire area encompassed by the annulus. This construction leaves no openings between the member 11b and annulus 17b, making it difficult for this form of the device to be accidentally caught on brush or other undergrowth.

The annulus 17b is best seen in FIGURE 11 and as there shown is formed with tabs 31 surrounded by the resilient material to provide peripheral lobes 22b similar to the lobes 22 of FIGURE 5. Holes 32 may be drilled in the tabs 31 to reduce weight and to bond the rubber-like material more firmly thereto. While any suitably rigid material may be used to form the annulus 17b, I prefer to use thin spring metal. The metal chosen should be attractive in appearance, impervious to corrosive effects of melted snow and ice, and light in weight. To meet such requirements I prefer to use a beryllium copper alloy plated with nickel for improved appearance and firmer bond.

As shown in FIGURES 9 and 10, stiffening ribs 21b are molded into the member 11b in proximity to the edges of the arms 26-29. Conveniently, and preferably, the ribs 21b are formed in the shape of interlocking ellipses when viewed from below, as in FIGURE 9. While the ribs 21b are here shown as being molded integrally with the member 11b, it should be noted that these ribs could be formed of a stiffer material bonded to the member 11b.

From the foregoing it will be seen that I have provided a novel, light-weight, molded ski pole ring construction which may be easily and quickly installed on the shaft without requiring additional fastening devices and which affords an improved snow penetration-limiting action, while at the same time holding the ring from flopping loosely at the end of the ski pole and providing an automatic snow-removing action.

I claim:

1. A snow penetration-limiting device for ski poles, comprising a flattened member of resilient material having an enlarged hub formed with a central opening proportioned for mounting in resiliently gripping engagement on a ski pole in spaced relation to the lower end thereof, said member having a plurality of circumferentially spaced radially extending flattened arms, and an annulus of rigid material secured to and supported by said arms in concentric relation to said hub, each of said arms terminating in a rounded lobe extending radially past said annulus.

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2. A snow penetration-limiting device for ski poles, comprising a flattened member of resilient material having an enlarged hub formed with a central opening adapted for mounting in gripping engagement on a ski pole of considerably larger diameter than said opening in spaced relation to the lower end of the pole, and an annulus of relatively rigid material secured to said flattened member in concentric relation to said hub, the portion of said resilient material between said hub and said annulus being under tension whereby said portion will remain taut when said hub is expanded radially by mounting on a ski pole.

3. A snow penetration-limiting device for ski poles, comprising a flattened member of resilient material having an enlarged hub formed with a central opening adapted for mounting in gripping engagement on a ski pole of considerably larger diameter than said opening in spaced relation to the lower end of the pole, three flattened arms formed integrally with said member and extending radially therefrom in equally circumferentially spaced relation thereto, and an annulus of relatively rigid material secured to and supported by said arms in concentric relation to said hub, said arms being under tension whereby the arms will remain taut when said hub is expanded radially by mounting on a ski pole.

4. A snow penetration-limiting device for ski poles, comprising a flattened member of molded rubber-like material having an enlarged hub formed with a central opening adapted for mounting in resiliently gripping engagement on a ski pole of considerably larger diameter than said opening in spaced relation to the lower end of the pole, and an annulus of relatively rigid material secured to said member in concentric relation to said hub, said rubber-like material having the property of shrinking during the molding thereof so as to place the portion of said member between said hub and said annulus under tension whereby said member will remain taut when said hub is expanded radially by mounting on a ski pole.

5. A snow penetration-limiting device for ski poles as described in claim 4 and wherein said rubber-like material consists of cured gum rubber having a reading of about 55 to 70 durometer.

6. A snow penetration-limiting device for ski poles, comprising a metal annulus, and a flattened member of resilient rubber-like material bonded to said metal annulus and having an enlarged hub provided with a central opening adapted for mounting in gripping engagement on a ski pole of considerably larger diameter than said opening in spaced relation to the lower end of the pole, the portion of said rubber-like material between said metal annulus and said hub being under tension whereby said portion will remain taut when said hub is expanded radially by mounting on a ski pole.

7. A snow penetration-limiting device for ski poles, comprising a flattened member of resilient material having an enlarged hub formed with a central opening adapted for mounting in gripping engagement on a ski pole of larg-

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er diameter than said opening in spaced relation to the lower end thereof, said member having a plurality of circumferentially spaced radially extending flattened arms radiating from said hub at 120° intervals, and a flattened metal annulus bonded to and supported by said arms in concentric relation to said hub, each of said arms terminating in a rounded lobe extending radially past said annulus.

8. A snow penetration-limiting device for ski poles, comprising a flattened member of resilient material having an enlarged hub formed with a central opening adapted for mounting in gripping engagement on a ski pole of larger diameter than said opening in spaced relation to the lower end thereof, said member having four circumferentially spaced arms extending radially in the form of a cross from said hub, and an annulus of rigid material secured to and supported by said arms in concentric relation to said hub, each of said arms terminating in a rounded lobe extending radially past said annulus, said flattened member having no openings therethrough between said hub and said annulus.

9. A snow penetration-limiting device for ski poles, comprising a flattened member of resilient rubber-like material having an enlarged hub formed with a central opening adapted for mounting in gripping engagement on a ski pole in spaced relation to the lower end thereof, said member having four circumferentially spaced arms extending radially in the form of a cross from said hub, and a flat metal ring bonded to said arms in concentric relation to said hub, each of said arms being formed to extend radially beyond said flat metal ring so as to provide circumferentially spaced rounded flattened lobes, said flat metal ring having outwardly projecting tabs embedded in said lobes and bonded to the rubber-like material of said member.

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