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C. F. MITCHELL

3,078,097

POROUS BOWLING BALL PATCH

Filed Dec. 15, 1959

FIG. 1

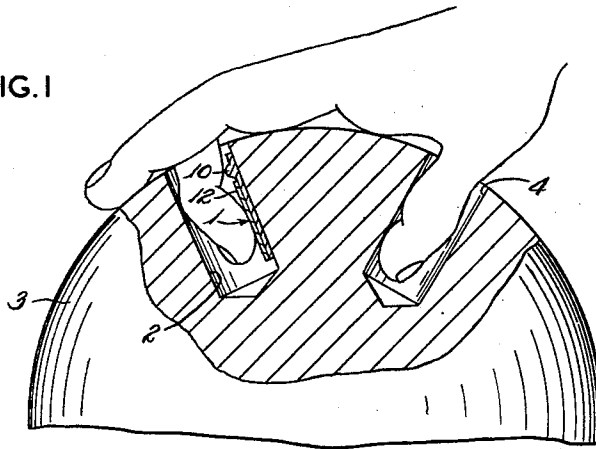


FIG. 2

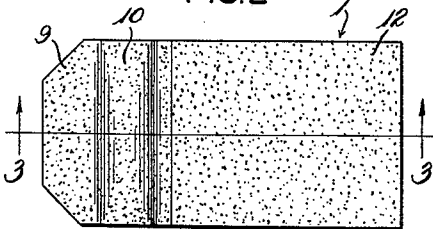


FIG. 8

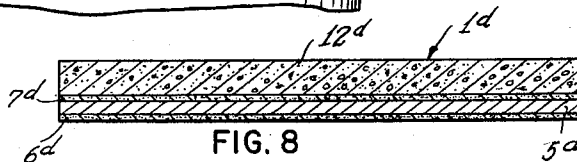


FIG. 3



FIG. 4

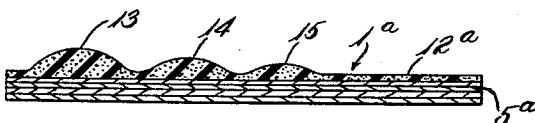


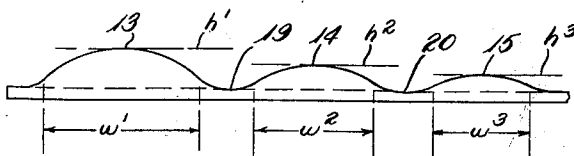
FIG. 5



FIG. 6



FIG. 7



1

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## POROUS BOWLING BALL PATCH

Charles F. Mitchell, 181 Crescent Drive, Akron, Ohio

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10 Claims. (Cl. 273-63)

This invention relates to bowling ball finger or thumb patches, and especially to a novel type of such patch having a transversely extending solid rib provided therein together with a foam or spongy porous finger engaging section.

The sport of bowling is becoming more and more popular all the time and naturally players participating in such game desire to have as large a score as they can possibly achieve. Thus, after a bowler has played the game for some length of time, it is difficult to improve his game because of certain habits the bowler forms, and for other reasons. In general, it is quite difficult to have increases in normal bowling scores after one has played the game for some time. It will be realized that only very minute differences in the manner of rolling the ball down the alley and the actual release of the ball by the bowler onto the alley make a great deal of difference in the actual results obtained. The smooth, slippery surfaces of the finger holes make accurate control of the ball very difficult. Thus there have been efforts made heretofore to facilitate the grip of the bowler with a bowling ball by the provision of thumb and finger patches as covered in my previous United States Letters Patent No. 2,708,578. Such additional patches have been very convenient to secure in bowling ball holes to give the bowler better engagement with the ball and hence, better control of the ball at the instant of throwing or releasing the ball onto the alley. Such extra or insert patches have been very useful in the balls, even though the bowler has had special spacing and diameters provided on these finger and thumb holes by purchase of an individual ball to his specific requirements.

The general object of the present invention is to provide a novel and improved type of a bowling ball finger and thumb insert patch characterized by the combination of a solid grasping rib in the insert patch with a layer of resilient material on another section of the finger insert patch.

Another object of the invention is to combine use of a cellular compressible material in a bowling ball finger hole insert patch, together with a solid but flexible rib on the insert patch for effective anchoring action for engaging a person's finger at the first joint therein when a bowler's finger is inserted into a bowling ball finger hole having such insert patch therein.

Yet another object of the invention is to combine the use of a thin spongy material in a bowling ball finger patch together with a solid, but flexible rubber and/or cork rib whereby a comfortable but effective gripping action can be provided by the patch of the invention.

Another object of the invention is to provide a novel and improved type of an insert patch for use in a bowling ball finger or thumb hole and with such patch being of relatively inexpensive construction, but having desirable operative properties and a long useful and serviceable life when positioned in a hole in a bowling ball.

Other objects of the invention are to make the bowling ball patch or pad from foamed neoprene rubber which has a specially ground top surface thereon exposed to provide a porous frictional gripping surface on the pad or patch; to provide a novel method of manufacturing bowling ball pads or patches wherein a ground top surface is provided to insure the provision of a surface having no skin thereon and with a number of pores being provided therein; to provide a plurality of ribs in a bowling ball patch all of the same radius but of a progressively de-

2

creasing height and width along the length of the bowling ball patch; to utilize a very thin porous plastic layer as the main body of the patch; and to use an improved strength, high friction material in making bowling ball hole patches or pads.

The foregoing and other objects and advantages of the invention will be made more apparent as the specification proceeds.

Reference now is directed to the accompanying drawings which show one embodiment of a bowling ball finger or thumb hole insert patch embodying the principles of the invention, and wherein:

FIG. 1 is an elevation, partially shown in section, of a bowler's hand operatively engaging associated finger and thumb holes of a bowling ball;

FIG. 2 is a plan of the improved bowling ball finger patch of the invention;

FIG. 3 is an enlarged vertical section of the bowling ball finger patch of FIG. 2;

FIG. 4 is a vertical section of the new and improved porous multi-rib patch of the invention;

FIG. 5 is a modification of the porous patch of the invention;

FIG. 6 shows a patch made from a combination of different densities of foam or porous material in a bowling ball finger patch;

FIG. 7 is a fragmentary vertical section, enlarged, showing details of the construction of the ribs of the patch of FIG. 4; and

FIG. 8 is a section on a further patch of the invention.

It is an important feature of the invention that very desirable bowling ball pads or patches can be made by use of porous plastic material in very thin layers or sheets where ground top surfaces are provided on the plastic material, which forms the main component of the patch or pad. Foamed or blown, small-celled neoprene has been one very good material for use in making the pads of the invention.

When referring to corresponding parts shown in the drawings and referred to in the specification, corresponding numerals are used to facilitate comparison therebetween.

The present invention, in one phase thereof, relates to an improved type of a bowling ball insert patch comprising an adhesive flexible backing layer having an adhesive coating on both surfaces thereof and having a back surface for engaging a wall of a bowling ball finger hole, a solid, but flexible solid strip secured to the face surface of the backing layer adjacent the top end thereof, which strip has a solid rib thereon of greater thickness of the remainder of the strip extending transversely thereof, and a sheet of porous plastic material secured to the remainder of the face surface of the backing layer adjacent the solid strip, which foam material is of substantially uniform height throughout.

With reference to the details of the construction shown in the accompanying drawings, a bowling ball finger patch of the invention is indicated as a whole by the numeral 1. Such patch 1 is shown positioned in a finger hole 2 provided in a bowling ball 3. Such ball 3 also has a suitable thumb hole 4 provided therein and another finger hole may be provided in the ball, if desired. In all events, the patch 1 of the invention can be engaged with or positioned in either the thumb hole or, finger holes of the bowling ball, or both, as desired by the individual bowler.

This finger patch 1 is provided with a flexible backing, or adhesive layer 5 usually made from a paper, or thin fabric sheet and with an adhesive coating indicated at 6 and 7 in the enlarged drawing on FIG. 3, on the back and face surfaces, respectively, of this sheet in the backing layer 5. Thus the adhesive coating 6 is adapted to engage with the associated surfaces or wall of the hole

2, and with the adhesive used being of the pressure sensitive, or contact type so that it will adhere to the wall of the finger hole when once firmly pressed into engagement therewith.

When the patch 1 is initially produced and before its engagement with the finger hole 2, a suitable paper, or other backing sheet 8 usually is secured to the backing layer 5 and may extend from one end thereof or be split into two pieces for ready disengagement or pulling from the backing layer 5 at the time of placing the patch 1 in engagement with the finger hole 2. The adhesive layer 7 provided on the face of this backing layer 5 has a solid, but flexible resilient rubber, or rubber-cork strip 9 secured thereto at the top or outer end of this patch 1 when considering how it is positioned in the finger hole 2. Such strip 9 is of conventional composition and is relatively hard. The strip 9 may be made from solid rubber and may, for example be approximately  $\frac{1}{32}$  inch, more or less, in thickness, depending upon the specific properties desired therein. In all events, as a feature of this patch 1, the flexible strip 9 has a rib 10 provided thereon and formed integrally therewith to extend transversely thereof substantially from margin to margin of the strip 9. This rib 10 is preferably several times the thickness of the remainder of the strip 9 at the maximum thickness portion of the rib 10. Usually the lateral margins of the rib 10 are tapered in thickness and the rib 10 is of arcuate top contour to provide smooth surfaces and edge portions on the rib 10 to avoid too much protuberance of the rib into the finger hole when operatively positioned. FIG. 3 of the drawings best shows that this rubber strip 9 has an anchor section 11 provided thereon in the portion of the rubber strip lying axially within or extending into the finger hole 2 from the rib 10. Such anchor section can be of any desired length, including that of the patch 1, to provide effective means on both sides of the rib 10 to bind it to the patch 1. The anchor section 11 preferably tapers to a feather edge at its inner end, if shorter than the patch.

Yet another important feature of the patch 1 of the invention is that a sheet of foam, or porous material 12 is secured to and covers the remainder, if any, of the face surface of the backing layer 5, being secured thereto by engaging with the adhesive layer 7. This foam material also extends over and covers the anchor section 11, in the portion thereof protruding inwardly from the rib 10, being secured thereto by a conventional pressure sensitive, or contact adhesive means 111 applied to the outer face surface of this anchor section 11. Hence the sheet of foam material may engage only the anchor section 11, or the inner end of the anchor section 11 and any exposed part of the face of the backing layer 5. By such engagement of the foam material with the anchor section 11, this aids in effectively retaining the strip 9 in position, even though appreciable forces are applied to the rib 10 at the instant of ball release, or at other times when the bowling ball is used by a person that has a finger engaged with the patch 1.

The drawings clearly show that the foam material 12 covers the major portion of the length of the patch 1 and with the ball, or tip of a bowler's finger engaging with the foam material. This foam or cellular material 12 is preferably made from foamed, or expanded neoprene. The foam material 12 presents a good friction surface for engaging the bowler's finger and avoiding any slipping of the finger with relation to the foam material 12. Furthermore, the rib 10 is of such a height as normally to engage the bowler's finger adjacent the first joint therein and provide an effective, solid gripping surface in the finger hole.

The foamed material or sheet 12 may be made from natural or synthetic rubber, or rubber-like materials or thermoplastic materials, or similar polymeric materials. Usually conventional reinforcing, or strengthening agents

are present in the foamed material to improve the strength and abrasion resistance of the material.

It should be realized that other suitable material, such as a porous rib of rubber-cork material as disclosed in my previously referred-to patent, may be used in forming the finger rib engaging section or strip 9 of the finger insert pad of the invention. Thus such rubber-cork layer might comprise approximately 40% of a rubber-like material with about 60% of small cork granules being intimately mixed and ground together so as to provide a uniform mixture of the materials and with no large particles being present therein. Such a type of a material will form a resilient, but solid rib 10 integral with the strip 9, and provides numerous tiny gripping surfaces for engaging a bowler's finger to aid in retaining the finger in tight or fixed engagement with the finger patch 1 and the bowling ball for control thereof.

It will be noted that the porous layer 12 can be of any suitable thickness and is not as thick as the rib 10, as indicated in the drawings. The porous layer 12 is readily compressible, and is soft. An effective gripping action can be secured even though such porous strip is, at maximum, only approximately half, for example, the thickness of the rib 10. It will be noted that the improved finger patch 1 of the invention can be of any desired length and may extend the full depth of the finger hole 2 in the bowling ball, or it may be slightly shorter than such hole and can either be associated directly with the axially outer end of the finger hole, or be spaced slightly therefrom, as desired. All of this provides individual adjustment to any bowler applying one of these control patches to a bowling ball finger hole.

The use of foamed neoprene material when forming the strip 12 is particularly desirable inasmuch as such material has been found to have very high strength, and to have a very desirable type of a frictional surface provided thereon. Such frictional surface normally is provided by grinding the top surface of the foam material surface normally is provided by grinding the top surface of the foam material to remove any surface film therefrom, or else the neoprene material may have a cut surface forming the top of the layer. Such foam material in the strip 12 may have been cut from a thicker block or layer of the foam material provided and wherein a plurality of layers may have been formed therefrom. In all events, any skin on such material is removed therefrom before using it in practice of the present invention. The flat surface ground strip 12 may extend the length of the patch 1 and the rubber strip 10 may be omitted, if a flat-surfaced, compressible patch is desired. The ground surface of the cellular material still will provide excellent gripping properties.

With reference to the improved bowling ball finger pad or patch shown in FIG. 4, it is indicated as a whole by the numeral 1a. In this embodiment of the invention, the foamed layer 12a shown is provided with a plurality of ribs 13, 14 and 15 thereon, starting from the top or outer end thereof and progressively decreasing in height and length axially of the patch 1a of the invention. Again, the entire top surfaces of the foam layer 12a and of the ribs 13, 14 and 15 are made by a grinding, or other suitable cutting action so that porous portions of the foam material are available for frictional engagement with the finger of a bowler placed in such hole. These ribs 13 through 15 preferably will extend slightly more than half the length of the patch or pad but with such ribs, of course, extending transversely of the pad as indicated in the vertical section shown in FIG. 4. The outermost rib 13 naturally will be of several times the thickness of the remaining portion of the layer where it is of a uniform thickness. For example, the foam material at its maximum height in the rib 13 may be of about .091 inch in thickness, the rib 14 may be of a maximum thickness of about .079 inch, and the smallest rib 15 may have a maxi-

5

num height of approximately .067 inch. The actual foam layer 12 at its uniform thickness area may be of the order of .02 inch thick but even with this very thin layer of material, an effective gripping action is secured. Obviously by holding the thickness of the bowling ball patch to a minimum, the patch or pad will usually not require the use of any enlarged hole for receiving the finger of the bowler and this aids in obtaining an effective control action. The entire thickness of the adhesive carrier paper 5a, shown in FIG. 4, including both adhesive surfaces thereof, can be approximately .012 inch and this likewise aids in maintaining a minimum overall thickness for the patch at the inner end thereof.

FIG. 5 shows another modification of the invention wherein a bowling ball patch 1b is illustrated and in this instance has only one rib 13b thereon and extending transversely thereof. Such rib will be of several times the thickness of the flat portion of the form strip 12b, and the rib 13b is immediately adjacent the outer end of the patch 1b.

In some instances it may be desirable to combine the use of different densities of foam material in providing a finger patch of the invention. Thus FIG. 6 shows how a relatively denser, or firmer type of a foam material 16 is provided adjacent the outer end of a bowling ball patch 1c and with a thinner or less dense, lighter and more compressible foam material 17 being used to form the uniform thickness portion of the outer surface of this patch 1c. A rib 18, provided in the denser foam material 16, is of approximately the same size as the similar ribs referred to in structures shown in FIGS. 4 and 5, and would be several times the thickness of the foam material 17. Some suitable type of a conventional contact, or similar, cement can be used to secure abutted end portions of the same height provided in the denser foam material 16 and lighter foam material 17 together and have such members be secured as a unit to a suitable carrier strip such as is used in the other patches of the invention. The pad 1b or 1c would be of uniform thickness initially at all areas thereof and be ground to desired size and contour.

FIG. 7 is an enlarged showing of the various ribs such as can be used in the patch shown in FIG. 4. It should be particularly noted that the radii of the ribs 13, 14 and 15, as shown in enlarged form, in FIG. 7, are all the same but with the height  $h^1$ ,  $h^2$  and  $h^3$  of the ribs, respectively, progressively decreasing in length and with the widths  $w^1$ ,  $w^2$  and  $w^3$  likewise decreasing proportionately to the change in heights of the various ribs. These ribs are connected to each other by smooth connecting curves 19 and 20 at the lower margins of the ribs. Thus a very neat, attractive surface has been provided on the ribs and they are made of unitary construction by being formed from a single cellular sheet by a grinding action, as previously indicated.

The anchor strip 11 extending axially inwardly from the rib 10, FIG. 3 should at least be as long as the height of the rib 10. The foam layer 12 may be slightly spaced from the rib 10, or abut against it, as desired.

It is especially important that the foamed or cellular material used be of high tensile strength and have good abrasion resistance. The cells in the foamed material preferably are closed, being substantially microscopic in size, but some of such cells obviously are opened or cut by the grinding action to form the outer surface of the patch. In a layer of foam about .02 inch thick, several layers of the cells, at least, are present.

By the resistance of the neoprene rubber to aging and usual solvents, a wide range of adhesives can be used therewith. Hence a conventional adhesive can be applied to the back of the foam layer 12a, for example, and a paper cover strip 8, or other protective cover could be provided therefor. Such adhesive may be of a contact or a pressure sensitive type and be used to adhere the patch 1a to the wall of a bowling ball hole. Or, a carrier for

6

the adhesive may be used, such as the strip 5 of FIG. 3.

While normally the use of a very thin foamed sheet, such as .015 inch to about .025 inch, is desired, greater thicknesses may be used, but it is a feature of the invention that very good action is provided by the thin foamed, or expanded neoprene sheet.

The foam neoprene preferred in practice of the invention is of a closed cell construction and has a ground top surface to give very good gripping action and service life. Other plastic materials such as polyurethane, natural latex or other rubber or rubber-like materials can be used where made or compounded for maximum strength and abrasion resistance. The grinding is best performed by use of a medium to a coarse emery wheel or the like to obtain an effective grinding action without the formation of a chewed up, or irregular end surface.

An improved foam pad 1d of the invention has a smooth or flat top surface and is shown in FIG. 8. This pad or patch 1d has an adhesive carrier sheet 5d and layers of adhesive 7d and 6d thereon. The ground top surface of the foam layer 12d of the pad presents a flat surface, as in the other forms of the invention, with many irregular cell walls therein for effective gripping action in use. Any suitable plastic material is used for making this layer 12d. The layer 12d may be quite thin, such as about .02 to about .05 of an inch in thickness.

If desired, the paper backing strip 8 may be omitted, and the pad or patch may be mounted on a carrier board or sheet for display and sale purposes. The pad would be positioned in a hole in a bowling ball promptly after being removed from any such carrier board.

The present application is a continuation-in-part of my prior application Serial No. 776,802, now abandoned.

From the foregoing, it will be seen that an improved, tough neoprene foam pad has been provided by the invention and that very thin layers of such closed cell material make very satisfactory bowling ball pads, or patches. Hence the objects of the invention have been achieved.

While several complete embodiments of the invention have been disclosed herein, it will be appreciated that modification of these particular embodiments of the invention may be resorted to without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

1. A bowling ball finger or thumb hole patch comprising an adhesive flexible backing layer having a back surface for engaging a wall of a bowling ball finger hole, a solid, but flexible rubber-like strip secured to the face surface of said backing layer at the top end thereof, said rubber-like strip having a solid rib of several times the thickness of the remainder of the strip extending transversely thereof, and a sheet of relatively soft resilient foam material secured to said backing layer and contacting a portion of said rubber-like strip, said foam material being compressible and being of substantially uniform height throughout, said foam material having an open cellular outer surface for maximum frictional engagement with a bowler's finger or thumb.

2. A bowling ball finger or thumb hole patch comprising a flexible backing layer for engaging a surface in a bowling ball finger hole, said backing layer having a pressure sensitive adhesive coating on both surfaces thereof, a short flexible strip secured to and extending across the outer surface of said backing layer adjacent the top end thereof, said strip having a rib of several times the thickness of the remainder of the strip at the maximum rib thickness section thereof extending transversely thereof adjacent the center thereof, and a sheet of resilient foam material secured to the remainder of the outer surface of said backing layer whereby a porous gripping surface is provided to contact the first section of a person's finger engaging a hole in a bowling ball and said rib will engage the finger substantially at the first joint therein for reinforcing the finger engagement with the ball, said strip having an anchor section thereon longer than the height

of said rib extending axially inwardly of the patch from said rib and secured to said backing layer, said foam material being secured to the top surface of said anchor section and to the exposed pressure sensitive adhesive on the outer surface of said backing layer, said rib being firmer than said foam material.

3. A bowling ball finger hole patch comprising a flexible backing layer with adhesive exposed on both surfaces thereof one surface of which is for engaging a surface in a bowling ball finger hole, and a sheet of foamed material secured to the other surface of said backing layer and having an open cellular outer surface whereby a cellular gripping surface is provided to contact a person's finger engaging a hole in a bowling ball, said foamed material having a closed cell interior construction with the cells therein being substantially microscopic in size, said foamed sheet being of uniform thickness at least for the major portion of the length thereof.

4. A bowling ball finger hole patch comprising a flexible adhesive backing layer for engaging a surface in a bowling ball finger hole, and a top sheet of foamed plastic material operatively secured to a surface of said backing layer and having an open cellular top surface whereby a porous gripping surface is provided to contact a person's finger engaging a hole in a bowling ball, said foamed material being compressible and having a closed cell interior construction with the cells therein being substantially microscopic in size, said foamed sheet being of uniform thickness and extending at least the major portion of the length of the patch, said foamed sheet being between about .02 to about .05 of an inch thick for at least the major portion of the length thereof.

5. A bowling ball finger hole patch comprising a flexible backing layer with adhesive exposed on both surfaces thereof one surface of which is for engaging a surface in a bowling ball finger hole, and a sheet of foamed material operatively secured to at least a portion of the other surface of said backing layer and having an outer surface which is free from an impervious skin whereby a cellular gripping surface is provided to contact a person's finger engaging a hole in a bowling ball, said foamed material having a closed cell interior construction with the cells therein being substantially microscopic in size, said foamed sheet being of uniform thickness for at least the major portion of the length thereof.

6. A bowling ball finger or thumb hole patch comprising a flexible backing layer extending the length of the patch for engaging a surface in a bowling ball finger hole, said backing layer having a pressure sensitive adhesive coating on both surfaces thereof, a flexible relatively solid strip secured to and extending the length of said backing layer, said solid strip having a rib of several times the thickness of adjacent portions of the strip at the maximum rib thickness section thereof extending transversely thereof adjacent one end of the strip, the remainder of said strip extending from said rib to the opposite end thereof being of uniform thickness, and a sheet of relatively soft resilient foam material of less firmness than said strip secured to said strip adjacent said rib and extending to said opposite end of said strip, said sheet of foam material having a porous outer surface and being of the same width as said strip whereby a porous gripping surface is provided to contact the first section of a person's finger engaging a hole in a bowling ball and said rib will engage the finger substantially at the first joint therein for reenforcing the finger engagement with the ball.

7. A bowling ball finger or thumb hole patch compris-

ing a flexible layer extending the length of the patch, pressure sensitive adhesive means operatively associated with one entire surface of said layer for securing the patch to a surface in a bowling ball hole, said layer having a tapered rib of several times the thickness of adjacent portions of the strip at the maximum rib thickness section thereof extending transversely thereof, said rib being adjacent one end of said layer and with the remainder of said layer extending from said rib to the opposite end of said layer being of uniform thickness, and a sheet of resilient foam material secured to the outer surface of the said remainder of said layer whereby a porous gripping surface is provided to contact the first section of a person's finger engaging a hole in a bowling ball and said rib will engage the finger substantially at the first joint therein for reenforcing the finger engagement with the ball, said layer and said rib being made from different material than said foam material and being firmer than said foam material.

8. A bowling ball finger hole patch comprising a flexible adhesive backing layer for engaging a surface in a bowling ball finger hole, and a top sheet of relatively soft foamed plastic material operatively secured to a surface of said backing layer and having an open irregular cellular top surface whereby a porous gripping surface is provided to contact a person's finger engaging a hole in a bowling ball, said foamed material being compressible and having a closed cell construction with the cells therein being substantially microscopic in size, said foamed sheet being of uniform thickness for the major portion of its length and extending at least the major portion of the length of the patch, said foamed sheet being between about .02 to about .05 of an inch thick at least for the major portion of the length thereof, but also having a transversely extending rib adjacent one end thereof, which rib is of several times the thickness of the remainder of the sheet at the maximum rib thickness section thereof.

9. A bowling bowl finger hole patch comprising a flexible backing layer with adhesive exposed on both surfaces thereof one surface of which is for engaging a surface in a bowling ball finger hole, and a sheet of foamed material secured to the other surface of said backing layer and having an open cellular outer surface whereby a cellular gripping surface is provided to contact a person's finger engaging a hole in a bowling ball, said foamed material having a closed cell construction with the cells therein being substantially microscopic in size, said foamed sheet being of uniform thickness at least for the major portion of the length thereof, but having a solid rib of several times the thickness of the remainder of the sheet at the maximum rib thickness section thereof extending transversely of the sheet on the outer surface thereof, adjacent the outer end of the patch when positioned in a bowling ball hole.

10. A bowling bowl finger hole patch as in claim 9 where said sheet of foamed material is made from neoprene.

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