March 3, 1942. F. S. DE BEER 2,275,374

PLAYING BALL

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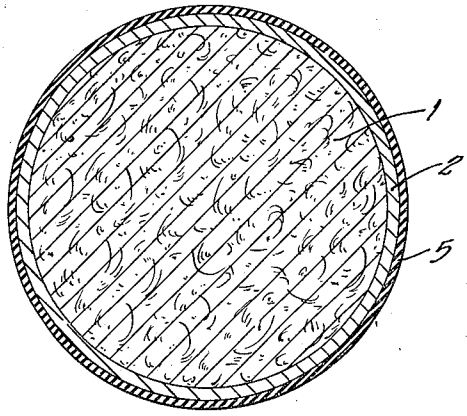


FIG. 1

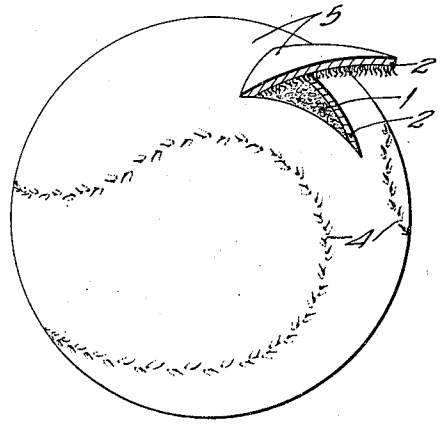


FIG. 3

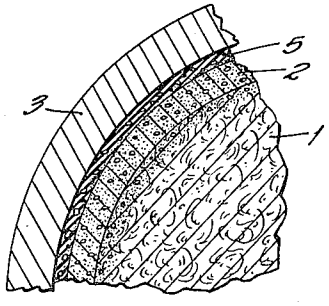


FIG. 2

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PLAYING BALL

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3 Claims. (Cl. 273—60)

This invention relates to baseballs and other kindred products such as softballs and playground balls.

A conventional baseball consists of a resilient spherical core enveloped by a cover comprising two identical figure-of-8 portions of leather or imitation leather sewed together in the familiar manner—the sewing of the cover seams being in all cases a hand operation.

Heretofore, it has been customary in the baseball manufacturing industry to employ relatively low-paid home-workers to sew covers—particularly the covers of the cheapest grades of merchandise—because only by so doing could the cost of sewing be kept low enough to enable a manufacturer to produce the cheapest grades of baseballs competitively. And it is generally true that the cheapest grades of baseballs with sewed covers have always represented a loss to the manufacturer or, at any rate, an unprofitable part of the business—but a part which no manufacturer, individually, could discontinue without suffering a loss of sales of higher priced profitable items.

Modern social legislation has made it impossible to continue the manufacture of hand-sewed baseballs which can be retailed at ten cents and hand-sewed softballs which can be retailed at twenty-five cents, because the loss on such items is now more than the industry can absorb; but there is still a very large and insistent demand for baseballs and softballs at the above-mentioned price levels. The industry has tried to satisfy this market with balls having no covers in the usual sense; balls comprising simply thread wound cores dipped in latex and vulcanized. Such a product will serve its purpose well enough; but the young boys and girls who constitute the principal market for cheap baseballs are not satisfied. Such products offend their pride of ownership because they do not even look like big league baseballs.

The chief object of my present invention is a ball which can be manufactured cheaply enough to sell without loss at the lowest price levels and which looks as much as possible like a conventional baseball or softball and, at the same time, is sufficiently durable to withstand for a reasonable time such usage as can be expected from young children.

My invention contemplates a new baseball and softball cover having no sewed seam, but having instead, preferably, a molded seam which is produced as an incident to the molding of the cover and which simulates a sewed seam well enough to be satisfactory. The new cover is a vulcanized latex composition consisting of a mixture of latex and a thickener such as flock and rutile—flock being finely divided cotton, while rutile is titanium dioxide (TiO_2). A cover of such composition, when produced and applied according to a method hereinafter described simulates to a gratifying degree, in appearance and texture, the usual leather cover. The simulation is not so faithful as to be at all deceptive, but it is suggestive enough to satisfy a child's preference for a ball which has the appearance of a regular baseball or softball. Such a cover is adequately durable, though not comparable in that respect to a good leather cover; and its cost of production is very low. Thus, I am able, by virtue of this invention, to produce profitably, or at least without substantial loss, a line of very cheap baseballs and softballs which are entirely acceptable to the trade.

A preferred embodiment of my invention is illustrated in the accompanying drawing wherein:

Fig. 1 is a section through a ball embodying my invention;

Fig. 2 is an enlarged fragmentary section illustrating a section of the ball enclosed in a mold, and

Fig. 3 is an elevation of a ball with a section cut from the outer portion thereof and bent upwardly.

Like reference characters indicate like parts throughout the drawing.

The playing ball embodying my present invention is an improvement over a ball which is and has been in use for some time. Such prior use ball has been provided with a cover which is composed of a yarn winding the various threads of which are cemented together to form a one-piece flexible protective shell around the ball. In preparing such winding the yarn has been coated or impregnated with latex or an equivalent rubber-like material wound tightly around a spherical core to form a shell which is made up of threads of yarn completely encase in rubber-like material. Playing balls made in the foregoing manner have had a rough, unsightly outer surface caused by the irregularities of the yarn winding. The playing ball embodying applicant's invention also comprises a core surrounded by a protective shell formed of a yarn winding at least the outer threads of which are cemented together by a latex compound, having a cellular structure. Additionally, however, a thin outer skin or cover also cellular in structure is provided which is integral with the protective shell. Such

outer layer conceals the irregularities due to the windings of the protective shell and very greatly enhances the appearance of the ball and correspondingly increases its salability.

In fabricating a playing ball in accordance with my invention I first prepare a pervious core 1 preferably formed of suitable compressible material and which, when compressed, is resilient and elastic. I usually employ a fibrous material such as kapok, felt clips, excelsior or sisal fiber for the core. The core is then wound with a layer of yarn or thread 2 which serves both to compress the core and maintain the same in spherical form. The thread is preferably comparatively small and may be of the order of coarse sewing thread, although any thread which is sufficiently strong for the purpose may be used.

In carrying out my invention I prepare a latex compound by mixing in a suitable receptacle latex with a filler or thickener, preferably flock and rutile (TiO_2), though I am not limited to these particular materials as a thickener. The mixture also carries a certain amount of water either that which is naturally in latex or that which is added to the compound, or both. The molding operation hereinafter described may be carried out more expeditiously and cheaply by using the latex compound in a wet condition. A sufficient amount of thickener should be used to impart to the fluid mixture a viscous consistency considerably thicker than that of ordinary paint as usually applied so that a sufficient amount of material will adhere to the ball when dipped.

In accordance with my invention, the ball is placed in a suitable mold 3 (Fig. 2) the interior of which is approximately the same size as the ball consisting of the core and the winding.

I have hitherto made a ball by dipping the ball in the latex mixture of the character described above and then placing the same in the mold. Since the ball consisting of core and winding is approximately the same size as the interior of the mold, the dipped ball will necessarily be larger than the interior of the mold and when the mold is closed some of the mixture is forced into the interstices between the threads of the winding while the excess mixture is forced from the mold between the two sections thereof. The mold is heated by electricity or otherwise and when the latex mixture is subjected to the heat of the mold, the water contained therein is converted to steam some of which is forced into the interior of the core. Steam also seeks to escape from the mold outwardly but is limited in its outward movement by the solid mold. I believe, however, that the steam does escape through the latex mixture to a position against the inner wall of the mold where it displaces some of the latex compound and forms depressions on the outer surface of the ball which I shall, for convenience, term miniature craters or pock marks which present, particularly in the vicinity of the seams of the ball, an unsightly appearance which detracts from the salability of the ball. However, inasmuch as the ball is closely confined, considerable pressure is exerted by steam which has been forced into the core of the ball and this has a tendency to expand the ball and force some of the latex compound outwardly against the wall of the mold. Some of the latex compound is forced through the steam pockets breaking them up into smaller pockets. Therefore, when the ball is removed from the mold, its surface where such steam has accumulated has a coarse honey-combed appearance. I believe that the honey-combed or cellular appearance of the surface of the ball is due to the mingling of the steam with the latex compound during the vulcanizing process. Such honey-combed appearance detracts from the appearance of the ball.

In order to prevent the appearance of such unsightly craters over the outer surface of the ball, I paint the inner surface of the mold with a thin layer 5 of the latex compound of the character above described before inserting the dipped ball in the mold. Care must be taken, however, to insert the dipped ball and close the mold before the thin painted layer has vulcanized, as otherwise the thin skin formed from the layer painted on the interior of the mold will not amalgamate and become integral with the latex compound of the ball which results from the dipping. When such thin layer is painted on the interior of the mold it sets almost immediately and conforms to the inner surface of the mold. Then when the dipped ball is inserted in the mold any steam which is generated cannot displace this thin outer layer which has now set and the finished ball has an outer surface which is relatively free from the coarse honey-combed or cellular structure above referred to. It is, however, still honey-combed or cellular but craters or pock marks on the surface are so small that they do not substantially detract from the appearance of the ball. The latex compound which fills the interstices between the threads of the winding is formed with such cellular structure.

If the wet painted layer is allowed to set or vulcanize completely and is then removed from the mold without any dipped ball being inserted it conforms almost exactly to the shape and pattern of the mold and yet shows a pervious cellular structure which I believe is due to water boiling out of the latex mixture as it sets or vulcanizes.

As stated above, the wound core is approximately the size of the mold, and when the dipped ball is inserted in an unpainted mold, the closing of the mold forces most of the latex compound from the surface of the yarn winding, and the criss-cross pattern of the yarn winding is plainly visible although the surface of the ball is smooth. However, when the mold is first painted before inserting the dipped ball, such thin latex layer sets and then when the dipped ball is inserted and the mold closed, the thin skin remains between the yarn and the interior of the mold, and while it does not entirely conceal the criss-cross appearance of the threads, it does tone it down to such an extent that the ball presents a more pleasing appearance. The usual seam of the ball is indicated at 4.

While I have given the theory of what I believe takes place when a dipped ball is inserted directly in a heated mold and also in a heated mold which is painted in its interior with a thin layer of latex compound prior to the insertion of the dipped ball, it will, of course, be understood that it is not possible to observe what takes place within the mold and I am not bound by any theory. I do know, however, that there is a very marked improvement in the character of the ball produced by first painting the interior of the heated mold before inserting the dipped ball as compared with the ball produced by inserting the dipped ball directly in the heated mold.

It will, of course, be understood that the ball is molded with the latex compound in a wet condition. By forming the outer portion of the ball as well as the outer layer with a pervious cellular structure any moisture remaining in the ball after it is removed from the mold may be forced out by heating the ball. This feature is of particular importance because the presence of moisture in the ball reduces its resiliency.

While I have described my invention in its preferred embodiment, it is to be understood that the words which I have used are words of description rather than of limitation. Hence, changes within the purview of the appended claims may be made without departing from the true scope and spirit of my invention in its broader aspects.

What I claim is:

1. A base-ball or the like comprising a core and a cover enveloping said core, said core including an outer layer of thread, said cover consisting of an undercoating of opaque, pervious, cellular latex compound applied to the exterior of said core and a thin pre-formed outer skin consisting wholly of opaque pervious, cellular latex compound enveloping said undercoating and core, said undercoating and said outer skin being united by conjoint vulcanization, said cover being characterized in that it penetrates to a substantial extent the interstices of said layer of thread and further characterized in that the outer surface thereof is substantially devoid of noticeably visible irregularities corresponding to the surface irregularities of said core, said base-ball having no cover in addition to that above defined.

2. A baseball or the like comprising a resilient core and a cover enveloping said core, said core including an outer layer of thread, said cover comprising only a resilient, pervious cellular under-coating consisting of a mixture of latex and thickener such as flock and rutile applied to the exterior of said core and a pre-formed, resilient, pervious cellular outer-coating consisting of a mixture of latex and thickener such as flock and rutile enveloping said core and under-coating, said under-coating and outer-coating being united by conjoint vulcanization to form a one-piece, resilient, pervious cellular cover for said core, which cover is characterized in that it penetrates to a substantial extent the interstices of said layer of thread and further characterized in that the outer surface thereof is relatively smooth and substantially devoid, at least to a commercially satisfactory extent, of noticeably visible irregularities corresponding to the surface irregularities of said outer layer of thread.

3. A baseball or the like comprising a resilient core and a cover enveloping said core, said core including an outer layer of thread, said cover comprising only a resilient, pervious cellular under-coating consisting of a mixture of latex and thickener such as flock and rutile, and an opaque, pre-formed outer skin enveloping said core and under-coating and consisting of substantially the same mixture as said under-coating, said pre-formed outer skin being united to said under-coating by conjoint vulcanization therewith, said cover being characterized in that it is resilient, pervious and cellular and further characterized by a smooth exterior surface substantially devoid, at least to a commercially satisfactory extent, of noticeably visible irregularities corresponding to the surface irregularities of said outer layer of thread.

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