July 27, 1943. R. S. LEWIS 2,325,330

RUBBER GLOVE

Filed Oct. 13, 1939

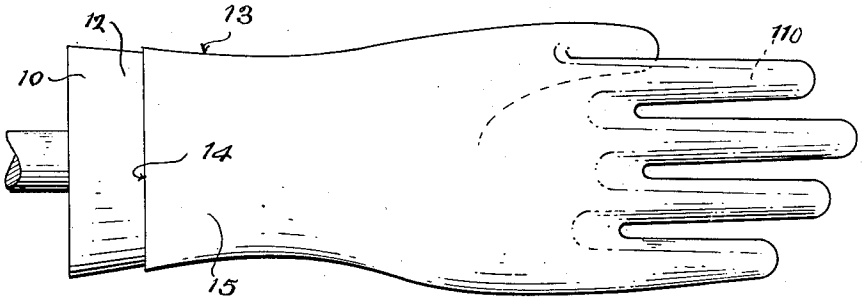


Fig. 1.

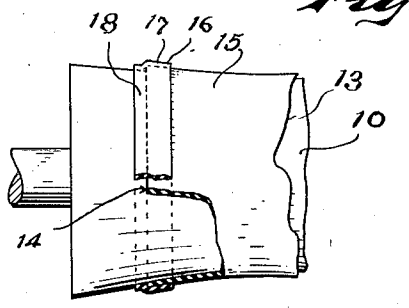


Fig. 2.

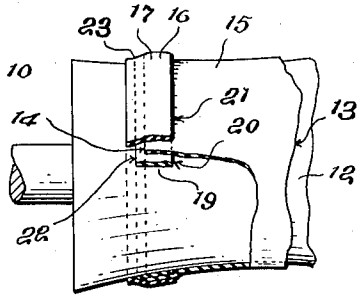


Fig. 4.

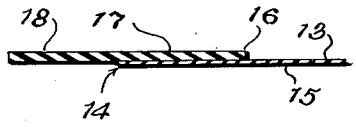


Fig. 3.

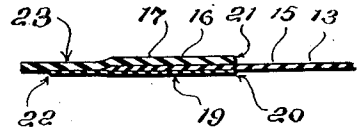


Fig. 5.



Fig. 6.

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RUBBER GLOVE

Richard S. Lewis, Willard, Ohio, assignor to Pioneer Rubber Company, Willard, Ohio

Application October 13, 1939, Serial No. 299,376

1 Claim. (Cl. 2—168)

The invention relates to improvement in method of manufacture of rubber gloves and in the structural formation of such gloves, to the end that novel improvements in the form and function of such gloves will be attained.

It is well known by those wearing rubber gloves, and by the manufacturer that such gloves tend to roll from the edge of the wristlet or gauntlet portion, especially in such gloves as are formed with a rolled edge, and I have also found such rolling tendency to develop where the edge portion has been thickened but retained in flat form for a distance by the application of a reinforcing strip encircling the extreme edge of wrist. In surgical gloves this tendency of the glove to roll down from the edge of the wrist is a serious objection and hampers procedure in an operation seriously. It is therefore an important aim of my invention to construct the edge portion of the wrist or gauntlet in such manner that it will remain flat against the arm of the wearer and will resist any tendency to roll, whether by an inherent elasticity and tension around the wrist, or by engagement with objects rubbing against the edge of the glove.

It is also an aim to effect the improvement in the functional characteristics of the glove at the same time that a substantial reinforcement of the glove is effected, and to enable the use of my invention in conjunction with various patterns or finishing or reinforcing methods.

The rolled edge has been formed on such gloves to overcome the weakness of the feather edge produced at the opening in the dipping of the form, to facilitate the removal of the glove from the form, and to minimize the liability of tearing the edge in such removal or in the ultimate use of the glove.

Some gloves are formed with both the rolled edge and a band binding located at or near the roll, but this does not stop the tendency of the glove edge to roll or cup when in use, and once a roll starts, it tends to continue.

The extreme seriousness of the objection to this action in surgical gloves will be appreciated when it is understood that it is a primary rule for surgeons to leave no part of their arm exposed during operations, and surgical gloves are made with close-fitting gauntlets of sufficient length to extend well over the sleeves of the gown or blouse worn by the surgeon. Adjacent the line where the sleeve passes from under the glove there is considerable fullness in the sleeve. By the inherent resilience of the fibers of the garment, it bulges outwardly abruptly beyond the glove edge, and the immediately adjacent sleeve portion exerts an expansive force which turns the edge of the glove outwardly. In the case of a mere flat edge even if thickened, the extreme edge is momentarily put under greater tension because of resistance of the outer surface portion to compression at the bend, but as soon as an additional portion of the edge portion is turned outward, projecting the edge further, the latter is relieved and permitted to contract slightly, resting against the subjacent external surface of the gauntlet. Here it engages frictionally, so that as further portions are turned outward, it becomes engaged under the following portions and forms a roll. Where a rolled edge is formed on the glove in manufacture, the action immediately begins at the stage last mentioned. In both instances the rolling movement is furthered by the contraction of the roll at its inner part on the glove. My invention counteracts these tendencies, as will appear.

A further important aim of the invention is to evolve a novel structural detail for the edge portion of the wrist in such a glove, and a novel method of forming the edge portion whereby it will function properly and attain various additional advantages.

Additional advantages, objects, and features of invention reside in the construction, arrangement and method of assembling of the parts, as will be readily understood from the following description and accompanying drawing, wherein

Figure 1 as in elevation of a glove form, with a glove body formed thereon and partially broken away.

Figure 2 is a fragmentary view of the form and glove similar to Figure 1, illustrating a further stage in the formation of the glove.

Figure 3 is a fragmentary longitudinal sectional view of an edge portion of the glove, greatly enlarged.

Figure 4 is a view similar to Figure 1, showing one of the possible methods of forming the wrist edge portion.

Figure 5 is a view similar to Figure 3, of the form of edging involved in Figure 4.

Figure 6 is a view similar to Figure 3 of a further modification.

There is illustrated a form **10**, familiar in the art for the production of rubber gloves, this form having finger portions **11** and an arm portion **12**. A glove body **13** is formed on this form by any usual practice of dipping and vulcanizing, these details being well understood in the art, and comprising no novel feature of my invention. How-

ever, it is important in my invention that the wrist edge portion 14 of the glove shall be uniform and that it shall correspond to a line parallel to the finished edge of the wrist or gauntlet portion of the glove when finished. After partial or completion of the vulcanization of the body of the glove, a band 16 of elastic rubber stock is applied to the edge portion of the gauntlet, either with or without the application of an adhesive to secure it in place, according to the method pursued. This band may be of thicker material than the body of the glove. It is important to note that the band is so applied that it projects beyond the finished edge 14 of the original body of the glove, so that the combined thickness of the glove body thereunder and the band form a thickened broad wrist band 17, and the edge portion 18 of the band projecting beyond the edge 14 of the glove constitutes a feather edge of reduced thickness extending entirely around the gauntlet and forming the finished edge of the glove. By not trimming the edge of the glove body formed in dipping, a slight taper is accomplished thereon, so that it merges readily with the body of the band 16. If desired, the glove may be stripped from the form before the band 16 is applied and the glove reversed, so that the side originally next to the form is brought to the outer side, after which a form corresponding to the arm portion shown in Figure 2 may be inserted in the glove while the band 16 is applied as before indicated.

If desired, an additional band 19 slightly narrower than the band 16 may be applied to the inner surface of the glove body adjacent and extending slightly beyond the edge portion 14, its inner edge 20 being alined with the inner edge 21 of the band 16, while its outer edge 22 stops short of the corresponding outer edge of the band, as shown in Figures 4 and 5. In this way, a very narrow further feathered portion 23 is formed at the extreme edge of the glove.

If desired, the inner band 19 may be applied on the form 10 as a band of latex which is partially cured, or completely cured, before the dipping of the form to produce the body portion of the glove, the dipping then being effected so that the upper edge portion of the band 19 is not submerged. After such further treatment of the body as may be required, or desired, the band 16 may then be applied as previously described, without removal of the body of the glove from the form, and any necessary final treatment of the completed structure then carried out, either while on the form or after removal, according to the nature of the treatments given.

In the use of such gloves, it will be appreciated that the sizes selected are such that the extreme edge of the gauntlet portion will fit tightly around the arm of the wearer, producing tension in the edge portion of the glove, so that in ordinary gloves having the rolled edge, this edge tends to automatically roll inwardly or downwardly upon the glove, exposing the arm portions of the wearer in an undesired manner. The same effect is manifest with gloves having a flat thickened edge, in lesser degree, such gloves tending to roll if any object strikes against the edge thereof in a direction such as to move the edge portion toward the outer part of the glove on the wearer's arm.

By the construction of my invention as illustrated, the extreme edge portion of the glove at 18 or 23 as the case may be, it is subjected to much lesser tension than the thicker portion therebeyond, so that it does not tend to facilitate the rolling thereof in case any object strikes against the edge of the glove, but such movement if developed, will be opposed by increasing tension in the projected feather edge to tend to stop the rolling movement and also when turned over outwardly upon the outer surface of the glove, this feather edge tends to lie flat against the glove surface, which will further oppose tendency to roll, if developed in the thicker portion thereadjacent.

Experience with gloves made in accordance with my invention has shown that it is extremely difficult to cause them to roll downwardly upon the arm and wrist of the wearer, especially in starting of such rolling action.

The importance of developing a glove which will oppose rolling movement will be further appreciated when it is understood that there is usually interposed between the edge portion of the gauntlet and the arm of the wearer a portion of sleeve or cuff, the gathering and bulging of such fabrics beyond the edge of the glove tending to raise this edge and facilitate rolling thereof in the ordinary glove. In my glove it has been found that such rolling is completely opposed and stopped, and its initiation prevented.

If desired, additional reinforcement features may be incorporated upon this glove to facilitate its application, as may be found desirable.

While I have described a specific embodiment and procedure in the production of the glove, it will be understood that these are purely exemplary, and that they are not limiting in the scope of the invention otherwise and hereinafter claimed, and that various changes in form, proportion, and steps of procedure may be followed in the practice of the invention without departing from the spirit thereof.

If desired, the glove may be produced by dipping the form as usual and as first described, to produce the body portion of the glove, and then after partial or complete curing of the body portion thus formed, a band or binding 24 similar to the band 16 may be applied to the gauntlet, spaced inwardly of the edge 14' of the opening on the body of the glove, so that the edge portion 25 of the body of the glove thus becomes the feather edge of the finished glove, as shown in Figure 6. This form of the glove may be reversed after application of the band 24, the surface which had been next the form in the moulding of the glove thus constituting the outer surface of the finished glove as worn, while the band 24 is located on the inner side of the gauntlet.

The proportions of the parts have been exaggerated in the views for the purpose of illustration, and in practice any usual thicknesses of material in the body and finger portions of the glove may be provided. The extent of projection of the feather edge 18 or 25 from the adjacent thickened band portion and lapped part of the glove body has been in the neighborhood of $\frac{3}{16}$ of an inch, although this may be varied somewhat without sacrificing the advantages of the invention. The thick reinforcement part 17 may be one quarter inch in width, more or less, or considerably extended inward on the gauntlet should any reason therefor so dictate.

Another function which is involved in my invention tending to prevent rolling movement of the edge of the glove, is the fact that if a roll is formed in the feather edge, as soon as it progresses to the outer edge of the thickened part 17 or corresponding parts of the other forms

of the article described, it will be chocked thereby, and before it can progress thereover, its tension will be greatly increased owing to the abrupt increase of circumference of the gauntlet, requiring a pronounced further stretching of the rolled portion.

The glove has the same advantages as above pointed out for use by nurses and others, as will be readily understood.

I claim:

A rubber glove of the character described comprising a body portion formed by dipping to produce a body portion having a terminal edge, an encircling band of thicker rubber applied thereto, extending from a line inwardly of the edge of said body portion to a line beyond said edge, and a second thinner band of elastic material applied to the inner surface of the glove aligned with the first band, but stopping short of the outer edge of said first band beyond said edge of the body portion of the glove.

RICHARD S. LEWIS.