Dec. 7, 1943. K. L. MILLIGAN 2,335,871

SURGICAL GLOVE

Filed Jan. 23, 1942

Fig. 1.

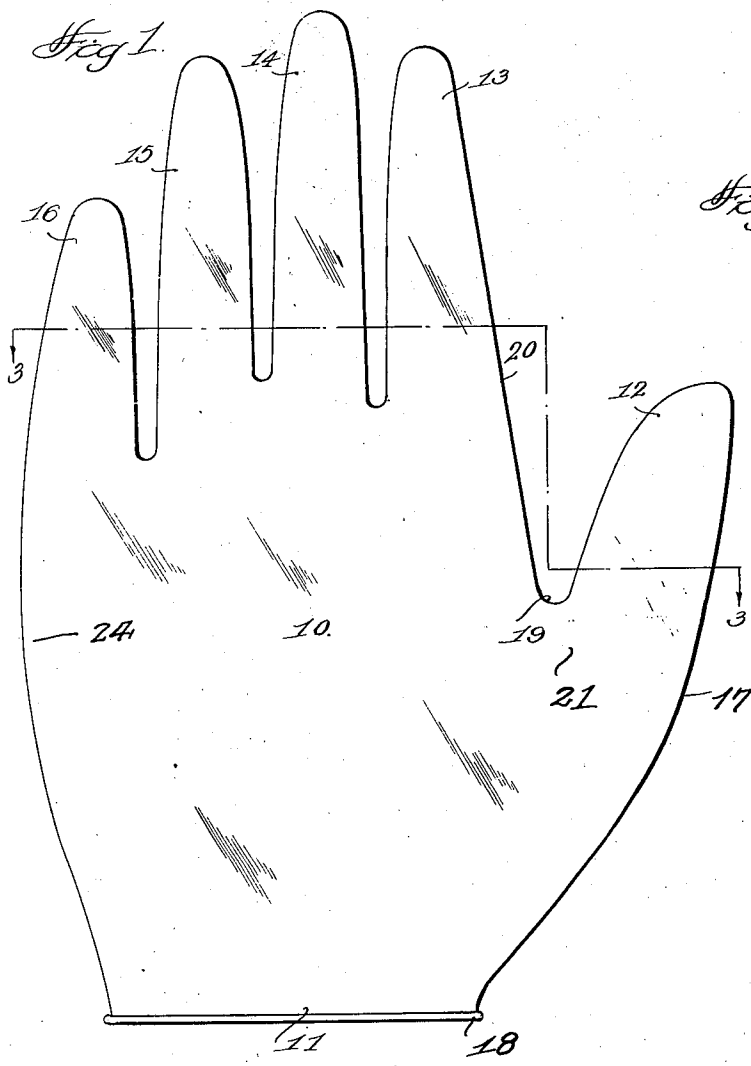
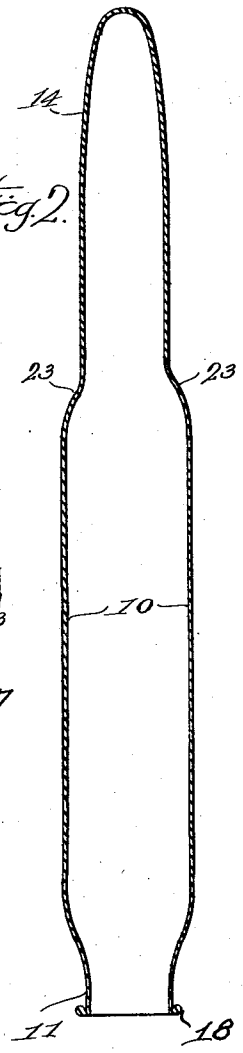



Fig. 2.



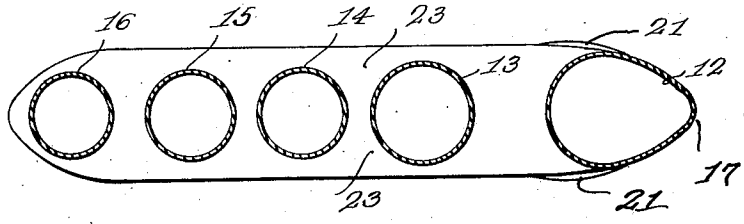




Fig. 3.

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2,335,871

## SURGICAL GLOVE

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Application January 23, 1942, Serial No. 427,978

1 Claim. (Cl. 2—168)

The invention relates to rubber gloves, and particularly to the production of a glove which may be used either for the right or left hand, and which will function effectively in either use. It is an especial aim of the invention to present a glove embodying peculiar features adding to the nicety of fit of the glove, when worn upon either hand, so that the glove is actually fitted to both the right and left hand, instead of being merely one of a general form not conforming to either hand, but requiring to be stretched considerably in order to accommodate the hand of the user.

I am aware of prior attempts to present a glove adapted to such use, which has been without success, and has not gone into use materially, the trade generally having reverted or adhered to the practice of shaping the gloves specially or either the right or the left hand, up until this time.

It is an especial aim of this invention to present a glove which will not draw tightly across the tops of the knuckles of the wearer, when worn upon either hand, by reason of a novel conformation in contour of the glove as molded, and a further important aim is to present a shaping of the thumb portion to the end that this also may be properly engaged upon either hand without causing objectionable binding over the base of the thumb, or metacarpal joint, over the metacarpus, and at the junction of the first phalange and metacarpus.

For the use of surgeons, it is desirable that gloves be free from liability of mistake in picking up a glove which is intended for one hand and attempting to put it upon the other, and for this reason it is the purpose of this invention to present a glove adapted to use upon either hand which may be quickly engaged upon the hand and will fit snugly thereon with a maximum of safety and conforming to requirements of hygiene fully.

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

Figure 1 is an elevational view of the glove in a direction normal to its major plane.

Figure 2 is a longitudinal sectional view of the glove transverse to said plane, showing the shape of the glove filled out, as it comes from the molding room.

Figure 3 is a cross sectional view on the line 3—3 of Figure 1.

There is illustrated a glove which is formed in one piece, in the nature of a skin of rubber or the like, and is customarily formed by dipping a form or mandrel having the shape which it is desired the finished glove shall conform to, into liquid latex or the like, so that a certain amount of liquid will adhere thereto, the liquid including materials suited to facilitating the vulcanization of the rubber when submitted to vulcanizing temperatures, and being vulcanized after one or more dipping operations to build up the desired thickness of covering upon the forms, after which the set material is stripped from the forms, and comprises the finished gloves. The glove illustrated has certain specific forms, particularly suited to each of the hands, these forms being manifest upon one side of the glove for one hand, and upon the other side of the glove for the other, and in addition, has an offset front portion adapted to accommodate itself to the form of either hand, as will appear.

The glove comprises a body or metacarpus covering central part 10, a carpus covering portion 11, considerably restricted in size, so as to fit snugly around the wrist of the wearer, a thumb covering portion 12, and respective finger portions 13, 14, 15 and 16, adapted to cover the fore-finger and second, third and fourth, or little, fingers of the hand. The finger portions differ only slightly from the finger elements of ordinary gloves, the difference consisting principally in being slightly fuller toward their bases than the ordinary fingers, and the major portion of the thumb extended from the glove has a shape generally similar to that of the thumb of an ordinary glove, but is offset from the metacarpus portion in the general direction of the major plane of the glove, but with a metacarpal prominence 17 of special form. This particular form of glove is adapted for examination purposes by surgeons and physicians, has practically no wrist portion except the small part adapted to cover the carpus of the hand, and the opening in the glove is arranged so as to engage snugly around the base of the carpus of the hand. It is formed with a reinforced rolled rim or edge ring 18, which at one side with the glove in open position lies approximately on the axis of the forefinger 13. The thumb element of the glove is extended from immediately adjacent this ring outwardly from said axis at an angle of approximately 35 degrees, to the outer wall portion of the glove at the medial plane, this part of the glove ex-

tending almost if not quite rectilinearly for a distance, and then being curved gradually inward to form the base of the thumb proper 12 of the glove, this curved part forming the metacarpal prominence 17. Between this prominence and the metacarpus covering portion 10 of the glove a considerable fullness is formed in the material of the glove, so that the prominence 17 and thumb 12 may be swung inwardly toward the palm of the hand with a minimum of stretching of material at the back of the hand when the glove is worn. The general form of the metacarpus covering portion and the metacarpal covering part and prominence 17 conforms to the shape of the hand of man when in repose and load flat. However, the thumb part 12 is extended at a very slight angle to the axis of the fore-finger 13, and a pronounced fullness is formed in the bight 19 between the thumb and metacarpus portion 10 of the glove. The boundary of the metacarpus portion of the glove adjacent the thumb is extended approximately rectilinearly as well as the forefinger portion 13, as may be seen at 20 in Figure 1. The form for producing this glove, in order to produce the fullness adjacent the bight 19 and at 21, at the base of the metacarpal covering portion differs from the ordinary glove form in being considerably thickened in the metacarpus portion and also in being considerably thicker at the side next the thumb than it is at the opposite edge, and having slight prominences on both sides adjacent the bight portion 19 and adapted to form fullnesses at 21, on both sides of the glove. The form is suitably thickened immediately inward of the metacarpal prominence 17 appropriately to the thickness of this part of the hand to be accommodated. The enlargement of the metacarpus portion of the form and glove produced thereon in a direction transverse to the major plane of the glove may be readily appreciated from an inspection of Figure 2 of the drawing, wherein it is seen that this part of the glove is approximately two-thirds greater in dimension from face to face than the corresponding measurement of the finger portions of the glove, this enlargement beginning immediately at the bases of the fingers, so as to form a curved wall portion 23 on each side of the glove, which may be termed a knuckle covering part, and entirely across the glove.

In consequence of the formation of the glove with the prominences 23 due to the enlargement of the glove at the bases of the fingers, the parts 23 are adapted to lie over the metacarpal knuckles of either hand, accommodating the glove readily thereto, so that the fingers may be easily flexed without special stretching or opposition to the ready movement of the fingers. Also, the movement of the thumb inwardly toward the palm is accommodated by the fullness 21, so that this may be effected without uncomfortable drag upon the back of the hand.

The outer edge portion of the glove at 24 is extended from the base of the little finger 16 with a slight fullness for a short distance, and is then curved inwardly to a line inwardly of the axis of the little finger, substantially as shown in Figure 1, when the glove is in the shape of the form upon which it is molded. The fingers 13, 14, 15 and 16 correspond in length to the average length of the fingers of the hand of the human being, in the various sizes of gloves which may be made, and these finger portions extend substantially parallel to each other with a suitable taper to fit snugly the third phalanges and surrounding tissues and nails at the extremities of the fingers.

The glove may be made in a range of sizes conforming to those generally followed in the making of ordinary rubber gloves.

While I have described an embodiment of the invention with particularity, in the form best known to me, it will be understood that this is merely exemplary, and that modifications in the proportions and shaping of the parts may be made without departing from the spirit of the invention, except as more particularly limited in the appended claim.

It should be appreciated that the enlargements 23 on each side of the glove need not be individually shaped and fitted to respective knuckles, but extend with substantially uniform shape from one side of the glove to the other. When the glove is worn, the part 23 at the outer side or back of the hand accommodates the knuckles at the bases of all the fingers, while the part 23 at the inner or palm side of the hand accommodates the fleshy fullnesses at the beginning of the palm of the hand next the bases of the fingers, and known in palmistry as the "mounts" of Mercury, Apollo, Saturn, and Jupiter, in order, beginning adjacent the little finger and ending at the base of the fore-finger. When the fingers are bent within my glove, the material at the beginning of the fullness 23 folds inward between the mounts named and the fingers. Also, it should be understood that the fullness at the bight 19, and at 21, is more than that heretofore provided merely for the accommodation of the flexor and extensor muscles and fullnesses of tissues about the base of the thumb such as the "Mount of Venus," in order to obviate stretching of the glove material to accommodate the shape of each hand.

I claim:

A glove body of the character described comprising a metacarpal covering and a thumb and four digit covering elements extended therefrom with axes in a common plane with the major plane of metacarpal covering portion, a bight portion being formed between the base of the thumb and body of the glove, said metacarpal covering portion being abruptly enlarged on each side adjacent the bases of the fingers to form knuckle covering prominences, the metacarpal covering portion of the glove being substantially enlarged toward the base of the thumb and having a special fullness adjacent the bight portion between the thumb and the body of the glove, said glove having also a metacarpal prominence between the thumb and the base of the metacarpal covering portion, for the purposes described.

KEN L. MILLIGAN.