Jan. 15, 1935. M. L. BLATT 1,987,922

FACE MASK

Filed Dec. 14, 1931

Fig. 1.

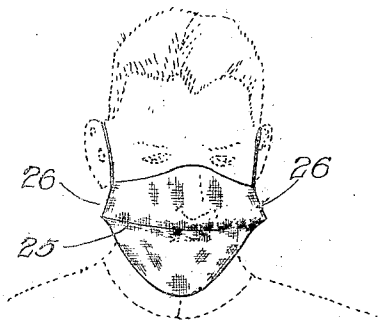


Fig. 2.

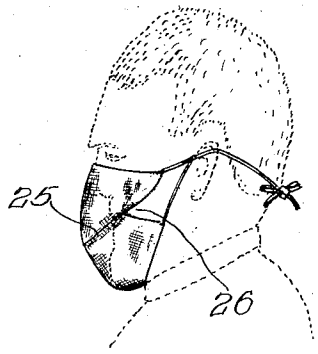


Fig. 3.

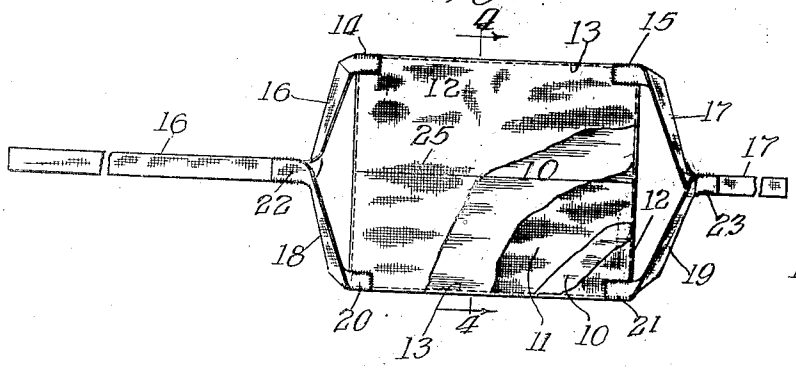


Fig. 4.

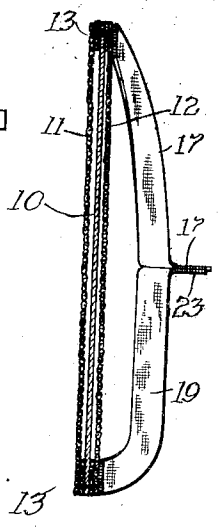
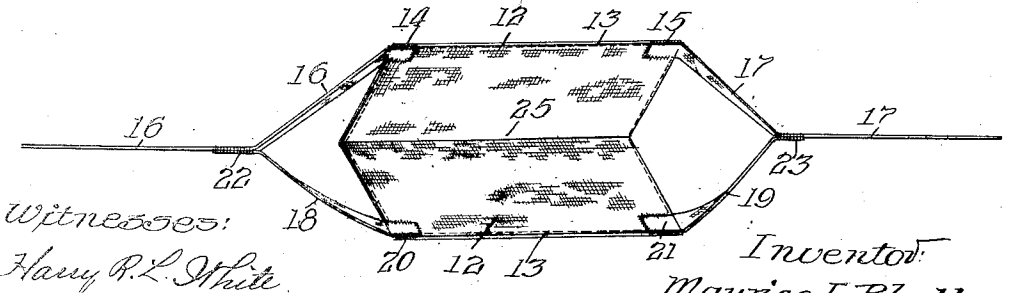


Fig. 5.



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FACE MASK

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4 Claims. (Cl. 128—139)

The invention relates to face masks particularly adapted for the prevention of infection coming from the mouth and nose of one individual to that of another and while my improved mask is particularly adapted to be worn by attendants and physicians in contagious disease hospitals, by surgeons in operating rooms, nurses caring for children or by mothers with infections caring for their children, it will be apparent that the device has not only these but other uses for which face masks may be employed.

It is stated upon reliable authority that the germs of infectious diseases are commonly expelled seven feet or more from the mouth of a human being in talking and that such infectious disease germs are forcibly expelled a distance of twelve feet or more in coughing or sneezing.

Furthermore, it is recognized that a relatively large number of the infectious diseases are communicated by germs that are transmitted by talking, coughing or sneezing in the air and which are taken into the respiratory tract through the mouth or nose of another and it is the primary object of my invention to produce an improved face mask that will tend to prevent the wearer under substantially any and all conditions from expelling into the air or taking into the respiratory tract through the mouth or nose infectious or disease germs and particularly such as might ordinarily be communicated to the mouth and nose of an individual by persons expelling the same in coughing, sneezing, talking, etc.

It is a further object of the invention to provide an improved face mask which is simple and economical in construction and efficient in operation for the described purposes.

It is a further object of the invention to provide an improved face mask of the described character that will be simple and economical in construction, of light weight, easily applied and may be efficiently used without the use of antiseptic substances.

It is a further object of the invention to provide an improved face mask that will be substantially impermeable to the impact or contact of various infectious disease germs.

Other objects of the invention will appear from the following description which is directed to the preferred embodiment of my improved face mask with particular reference to the illustrations appearing in the drawing which forms a part of the specification, the novel features being set forth in the appended claims.

In the said drawing:

Fig. 1 is an elevation view of my improved mask showing the manner in which it is applied over the nose and mouth of the wearer.

Fig. 2 is a side elevation view being taken at substantially an angle of ninety degrees from the view of Fig. 1.

Fig. 3 is a plan view of the mask with certain portions thereof broken away to better illustrate details of construction.

Fig. 4 is a sectional view through the body of the mask being taken substantially on the line 4—4 of Fig. 3 looking substantially in the direction indicated by the arrows.

Fig. 5 is a perspective view of the device of Fig. 3 illustrating the manner in which the same is folded and arranged for application to the head of the wearer to cover and protect the nose and mouth.

The body portion of my improved mask consists of a sheet of some light material that is preferably substantially impermeable to disease germs. Such material should also be possessed of flexibility and furthermore, and what is also of prime importance, it should have the quality of taking and retaining a crease. The material that I prefer as the inner or base portion of the body of my mask is an impervious to moisture sheet of very thin transparent pure regenerated cellulose of about the thickness of ordinary very thin calendered writing paper or analogous material that is quite commonly sold on the market under various trade names as "Cellophane" or "Glassine" and the like.

Bacteriological tests show that such a sheet of regenerated cellulose is substantially impervious to the impact of germs or other bacterial particles and furthermore, such material upon being sharply folded or creased will take a permanent angular form or crease which is a most essential feature of my improved face mask.

In the construction of the body portion of my improved mask with particular reference to the showing in Figs. 3 and 4, the reference character 10 designates a substantially rectangular sheet of thin cellulose, glassine or its equivalent material and on the outer faces thereof, I place the sheets 11 and 12, of a woven surgical gauze or butter or cheese cloth which consists of a loose weave of cotton or linen thread in a comparatively loose mesh weave with respect to the warp and weft threads. The woven fabric sheets 11 and 12 will preferably be attached to the outer periphery of the rectangular sheet 10 of cellulose by suitable stitching as desig-

nated by the reference character 13, Figs. 3 and 4, and preferably the sheets 11 and 12 will be cut somewhat larger than the inner and impermeable sheet 10 so that around their outer peripheries they may be folded over to increase their thickness and improve the finish of the assembled article around the outer periphery thereof where stitched together by the stitching 13.

This assembly of the two sheets of cloth and the sheet of cellulose completes the mask with the exception of the attaching device and the creasing that should be formed parallel with and midway between the top and bottom of the composite sheet forming the mask body.

At the corners of the body portion, flexible tape strips which may be of woven cotton or analogous material, may be stitched as shown or otherwise suitably secured. Such flexible woven tape strips will preferably be constructed and formed in the following manner: First, two strips of ⅜ inch width cotton tape, about 12 inches long, will be secured by sewing to the upper corners of the mask as designated at 14 and 15, Fig. 3, these tapes being designated generally by the reference characters 16 and 17. Other shorter strips of similar material, as designated by reference characters 18, 19, will be secured at 20 and 21 respectively to the lower opposite corners of the mask body and these tape strips 18, 19 attached to the lower corners will preferably be about 3 inches in length and they will be brought into contact with the longer tapes 16 and 17 at points as designated at 22, 23 about 2¾ inches from the point of attachment at 14 and 15.

The mask body thus constructed and with the attaching tapes as described is then in condition for use after it is provided with the median longitudinal crease or fold as designated by the line 25 in Fig. 5.

The fact that the lower tape strips 18 and 19 are somewhat longer than portions of the tape attached to the upper corners between the points of attachment of the lower tapes and the upper corners will enable the mask to be applied to the face of an ordinary wearer in the most efficient manner so that the mask will substantially cover along its upper edge as indicated in Figs. 1 and 2, the nose of the wearer while at the same time, it will pass beneath the eyes so as to avoid interference with vision while the lower half of the mask body below the longitudinal median line 25 will pass beneath the chin of the wearer and be held in the desired position by reason of the described differences in the lengths of tape branches from their point of union at 22, 23 respectively.

An important and necessary feature of the invention resides in the crease along the longitudinal median line 25 that is given to the body of the mask and which causes the inner thin impervious cellulose sheet 10 to take a permanent crease so that when the mask is applied in the manner illustrated in Figs. 1 and 2, the median line of longitudinal fold 25 will be posed about as illustrated in Fig. 1 and Fig. 2 thus tending to hold the body of the mask away from the mouth and to provide lateral ventilating openings that extend to the ends of the mask sheet as it is wrapped around the face. In other words, the angular housing thus formed by the fold along the median line of fold 25 serves as a ventilating passage having its two lateral termini as indicated at 26, Figs. 1 and 2, on each side of the face just in front of the ears and it will be seen that this ventilating passage has its discharge terminals pointing backwardly toward and adjacent the ears of the wearer when the mask is applied to the face over the mouth and nose as illustrated in Figs. 1 and 2.

Obviously the mask may be secured in the usual manner by tying the terminal strands 16 and 17 together over the back of the head and these strands may conveniently be passed over the top of the ears where they join the sides of the head to further assist in holding the device in position upon the face of the wearer.

The fact that the inner layer of non-permeable material, consisting of the thin cellulose material or its equivalent, will take and retain a permanent crease, gives the device, which is light, economical and efficient, a superior ventilating function because as illustrated in Fig. 1 and Fig. 2 it will be seen that when the mask is bent over the face of the wearer with a median line of creased fold 25 extending horizontally about over the mouth, there will be a substantial housing formed between the nose and the lower tip of the chin beneath the mask for breathing purposes with the air passages extending backwardly and discharging toward the ears of the wearer to prevent a sense of suffocation when the device is in position upon the face of the wearer.

Furthermore, the covering of cheese cloth or loosely woven gauze, especially on the inner side of the mask, gives the same a more comfortable feeling when coming into contact with the skin of the wearer and the looseness of the weave of the inner gauze also increases the ventilating function, and has adsorptive and absorptive functions.

This will tend to an extent to receive and in most cases prevent the expiration of germs that may be in the currents of air breathed and expelled through either the mouth or nose of the wearer.

But the important feature of my invention resides in the bacteriological feature of the mask in that the inner lamina of thin cellulose hydrate or its equivalent is substantially impermeable and yet so light and economical to construct that the mask may be worn and supplied at a reasonable cost and worn with a minimum amount of discomfort and furthermore, may be discarded whenever it is desired on account of its economical aspects. While in the construction of the inner impenetrable body portion of the mask I prefer to use the transparent cellulose material, I find that there are certain other flexible sheet materials that partake of the before mentioned characteristics of non-permeability, and flexibility and are able to take and retain a crease that gives them value as a substitute for cellulose materials in the manufacture of my mask. For example, I find that there are some forms of sized papers either with or without a treatment of paraffine or analogous material that will serve as the inner layer of the mask body. Thin sheets of celluloid resembling the normal transparent cellulose product as before described may in a like manner be used when of a nature and consistency to take and retain the described crease without breaking or becoming pervious to moisture at the crease.

I claim:

1. A face mask comprising an imperforate

sheet of relatively thin impermeable to moisture material of flexible character having length and breadth and the quality of permanently retaining a crease upon a line of fold when sharply folded upon itself, surface coverings on each of the opposite surfaces of the sheet of impermeable material said surface coverings being formed of sheets of loosely woven textile fabric and united around the periphery of the sheet, the said sheet with said coverings being folded upon a median longitudinal line of fold whereby to form a permanent crease in the body of the sheet of impermeable material, and flexible mask attaching devices in the form of tapes secured to the mask body at the respective ends thereof on opposite sides of the terminals of the said crease in the mask body whereby the mask may be positioned over the face of the wearer with the apex of the crease therein extending outwardly and transversely of the face and substantially over the lips of the wearer.

2. A face mask comprising a substantially rectangular, elongated, relatively thin, imperforate sheet of cellulose hydrate, in combination with an enclosing envelope of gauze, the said cellulose hydrate sheet within said envelope being creased longitudinally upon a median line of fold extending transversely between the respective ends of the said sheet, and flexible attaching strips secured to the respective corners of the described assembled rectangular mask whereby the creased mask body may be positioned over the face of the wearer with the apex of the crease extending outwardly and transversely of the face whereby to form in conjunction with said covered face surfaces a substantially closed breathing tunnel over the mouth and nose orifices of the wearer, the terminal openings of which breathing tunnel extend rearwardly of the face and toward the ears of the wearer.

3. A face mask comprising a rectangular sheet of relatively thin transparent, creasable cellulose hydrate provided with a permanent crease extending longitudinally of the sheet on a substantially median line of fold extending longitudinally between the respective ends of said sheet, a textile envelope covering the surfaces of the cellulose sheet, and flexible attaching means adapted to secure the composite body of the face mask over the nose and mouth of a wearer with the concave side of the fold or creased portion of the mask next the face of the wearer and with the mask body flexed to correspond substantially to the contour of the face and the said creased extremities thereof providing a ventilating function by providing air passages opening over the cheeks of the wearer, the venting terminals of which are directed towards the ears of the wearer.

4. A face mask comprising a substantially rectangular sheet of relatively thin imperforate waterproof material capable of taking and retaining a crease, the same being folded and creased upon a median line of fold and subsequently partially opened, a textile supporting envelope within which the imperforate rectangular waterproof sheet is positioned, and flexible attaching means secured to the respective corners of the rectangular mask body thus formed comprising a pair of flexible integral strips secured to the opposite ends of the rectangular body of the mask on one side of the crease, and a pair of flexible branch strips secured to the respective ends of the mask body in spaced apart relation to the points of securement of the first said strips and on opposite sides of the said median crease therein from the points of securement of the first said strips and the terminals of which are secured to the first said strips remote from the body portion of the mask body and at a distance along the first said strips from the mask body which is unequal to the length of said branch strips, whereby to provide greater looseness on one side of the creased median line of fold of the mask than on the other side of the crease to accommodate the contour of the chin when the mask is in adjusted position on the face of the wearer.

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