Specification of Julius Jeffreys : respirators.

A.D. 1850 . . . . . N° 12,984.

SPECIFICATION

OF

JULIUS JEFFREYS.

RESPIRATORS.

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A.D. 1850 . . . . . N° 12,984.

Respirators.

JEFFREYS' SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JULIUS JEFFREYS, of Bucklersbury, in the City of London, Gentleman, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Royal Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date at Westminster, the Twenty-eighth day of February (One thousand eight hundred and fifty), in the thirteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Julius Jeffreys, my exors, admors, and assigns, Her especial license, full power, sole privilege and authority, that I, the said Julius Jeffreys, my exors, admors, and assigns, or such others as I, the said Julius Jeffreys, my exors, admors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, my Invention of "IMPROVEMENTS IN PREVENTING OR REMOVING AFFECTIONS OF THE CHEST," in which said Letters Patent is contained a proviso, that I, the said Julius Jeffreys, should cause a particular description of the nature of my said Invention, and in what manner the same is to be performed, by an instrument in writing under my hand and seal, to be inrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Julius Jeffreys, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, are fully described and ascertained in and by the following statement thereof, reference being had to the Drawings hereunto annexed, and to the figures and letters marked thereon, that is to say:—

My Invention comprises certain improvements in respirators. A respirator being an instrument for giving warmth and moisture to the fresh inhaled breath derived from the exhaled breath in each act of respiration, for this purpose it is essential that the operating part of a respirator should be made of metal, and that the same spaces or channels should be employed for giving passage both the exhaled and inhaled breath. Metallic action is needed for conducting warmth and condensing moisture from the outgoing breath, and the same passages in common to both currents, that the entering air may receive the precipitated moisture from the surfaces on which it is deposited. These essential characteristics of the instruments for which I intended the name "respirators."

My first improvement is in the front covering or screen of the wire respirator. In place of the usual woollen gauze fabric, through which the currents of the breath pass from and to the instrument behind it, I substitute a front screen, Figures IV. and V. (Figure V. is an upright section) formed of narrow slips of metal or other firm material, *a*, *a*, *a*, *a*, &c. covered with silk or other fabric, and overlapping each other like the leaves of a venetian blind, but not so as to touch. A small fissure *c*, *c*, *c*, *c*, &c. exists under each of the leaves (which vary from four to eight in number, according to the size of the instrument) for giving passage to the breath, the leaves keeping themselves apart owing to the arched form given to them. Each leaf or slip is fixed along its concave edge to a horizontal bar of the metal "lattice," or frame *b*, *b*, *b*, *b* &c. which is sewed into the front silk drapery. The pleats of silk which enclose the slips are continued on at each end *f*, *g*, *f*, *g*, &c. to the extremity of the front drapery for the sake of symmetry, to give to the whole a pleated appearance.

Figure IV. is a section of a venetian front; down the middle along the line *a*, *a*, *a*, *a*, &c. Figure V. *b*, *b*, *b*, *b*, &c. is the lattice or frame to which the venetian leaves *a*, *a*, are fixed. *f*, *g*, *f*, *g* is one end of the drapery, the other end being cut off with half the venetian frame.

Figure V. is a front view of a venetian front complete. The portion *f*, *a*, *f*, being the venetian part over the respirator, and *f*, *g*, *f*, *g*, at either end being merely silk pleats carried on to the end of the drapery.

Figure VI. is a section of an oral respirator down the middle, with a

venetian front on it. *s*, *s* is the section of the packet of gold wire skeins forming the body of the instrument; *f*, *g*, *g*, *f*, the drapery; *h*, the left-hand ring; *i*, *i*, the lip tucks.

My second Invention consists in a modification of the metal work or operating part itself of the instrument. In this form the metal work does not consist of laminæ of wire work, or of perforated plates, through which the currents of the breath travel transversely or across the plane of the layers, passing through the several layers in succession, as in the usual instruments, and as seen in the direction of the arrows, Figure VI., but the metal work in this form consists of plates or rods or tubes, placed parallel and near to each other; and the currents pass in and out longitudinally in the direction of and parallel to the metallic surfaces, as seen by the arrows, Figure I. If plates are employed, as in the Figures, the currents alternate lengthways through the fissures between them; if solid rods or wires, the currents pass over their surfaces lengthways along the interstices left between them; and if hollow rods or tubes are used, the currents travel both through them and along their outer surfaces; in all cases the same channels being employed for the passage of both the exhaled and the inhaled breadth. Figures I., II., and III., exhibit this longitudinal respirator.

Figure I. is a vertical section down the middle, dividing the instrument across, along the line *a*, *e*, *a*, *b*, Figure II.

Figure II. is a view of the concave surface, or that which is applied to the face.

Figure III. is a view of the instrument from below, looking upon the edge *h*, *h*, Figures I. and II. The letters denote the same parts in all the Figures. *a*, *a*, *a*, *a*, are the concentric layers of thin metal forming the instrument, placed a minute distance apart and kept at that distance by embossing the plates, so as to produce projecting points or edges, or by placing wires or cords between them. *a*, *b* is the outermost plate extending in the middle an inch above the rest, and convex at its upper edge *c*, *c*, *c*, *c*, while all the rest are curved downwards along their upper edges, as seen at *g*, *a*, *g*, Figure II., so as to meet the back plate at their upper corners *i*, *i*, and to form the mouth piece *i*, *g*, *a*, *g*, *i*, *c*, *c*, *c*, *c*. A soft roll of velvet or leather *c*, *c*, *c*, *c*, lines the upper edge and rests on the upper lip. The surface *g*, *a*, *g*, *e*, *e*, *e*, is covered with soft cloth or leather, and rests against the lower lip and chin. The convex front of the instrument is covered with silk, cloth, or leather *d*, *d*, *d*, Figures I. and III. *f*, *f*, *f*, *f*, &c., are wires or threads binding the plates together. The instrument is suspended to the face by attachments fixed to the ends *f*, *i*, *f*, *i*. The arrows between *a* and *c*, Figure I., show the

current of the expired breath as it leaves the mouth to enter between the plates, and the arrows below at *a*, *b*, its exit from the instrument. The arrows if reversed would show the current of the inspired breath, both currents passing alternately by the same channels, which is essential to the principle of a real respirator. In this longitudinal respirator I claim such an arrangement either of flat or corrugated or pierced plates, or of solid rods or of wires, or of hollow tubes, as that numerous longitudinal channels shall be formed along all the surfaces of the material employed, through which channels the exhaled breath shall pass out and the inhaled breath shall enter, so that all the same surfaces shall be traversed over by both the outgoing and the entering current, and the latter current shall therefore receive from the surfaces moisture as well as warmth deposited upon them by the former current. This alternate flow of the two currents of the breath through the same channels will take place in an instrument constructed as in the Drawings, with a parallel arrangement of any of the above forms of matter, videlicet, plates, rods, wires, or tubes, provided the currents are allowed to take their own course unobstructed by valves. The employment of any of these forms of matter without valves falls therefore under my Invention. When this principle of longitudinal action is applied to the construction of a hand respirator I employ it, not only in the exterior flat form of the usual hand respirator, but also in a cylindrical form, as shewn in Figures 7 to 10. *a*, *a*, is the mouth piece, either of soft material, as padded leather or velvet, &c. or of firm material, as ivory, bone, wood, tortoiseshell, &c. *b*, *b*, is a hollow tube of thin metal, bone, ivory, or other hard material, on which the mouth piece *a*, *a*, is firmly fixed above, and into which a handle *c*, *c*, *c*, is fixed or socketed below. The portion of the hollow tube between b^1 and b^1 carries the acting metal work of the instrument, which may be given any of the forms mentioned above, as flat plates or rods, wires, tubes, or it may be a coil of flat metal rolled in a loose spiral *f*, *f*, Figure 8, and filling the space b^1 to b^1 of the tube. The small portion of the tube below the acting metal and marked *d*, *d*, is freely perforated all round to let the breath enter and pass out to and from the bottom of the fissues of the acting metal. Below *d*, *d*, a portion of the tube marked *e*, *e*, carries a sponge for receiving condensed moisture, and below the sponge the handle C, C, is fixed on. This handle may be of any convenient length, as a foot long, or it may be made long enough, when the instrument is removed from the mouth and held down by the side, to reach to the ground and be used like a stick.

Figure 7 is a front longitudinal section of this hand respirator, Figure 9, the tube *b*, *b*, and spiral metal within seen from below when the handle is

removed and the sponge taken out. The acting metal is supported in the tube by cross pins or a wire frame resting on the top of the handle. Figure 10 is a side view of the instrument, the letters corresponding with the other Figures. In Fig. 10 the handle C, C, is shewn supported on the handle H, H, of a parasol by the sliding and jointed bracket *g*, *g*, which is convenient for females, as employing one hand only for both. In this instrument I claim not only the longitudinal action of both currents of the breath along all and the same metallic surfaces, but also the general construction of this instrument in all its points of mouth piece, tube, handle, &c, should any other kind of acting metal be introduced into it as coils of fine wire, &c.

My third Invention consists in springs fixed to respirators for suspending them on the face. These springs are of various kinds, similar to those of spectacles, but stouter. Some are made to curve upwards so as to rest over the ears; and others to pass below the ears and embrace the neck. They are also made of sliding pieces that they may be lengthened and shortened, and with hinges to fold up. Though the soft and elastic attachments at present employed are in general much to be preferred as more comfortable and less projecting, there are cases in which the spring suspenders are convenient, on account of the quick suspension and removal they permit.

In witness whereof, I, the said Julius Jeffreys, have hereunto set my hand and seal, this Twenty-first day of August, One thousand eight hundred and fifty.

JULIUS (L.S.) JEFFREYS.

AND BE IT REMEMBERED, that on the Twenty-first day of August, in the year of our Lord 1850, the aforesaid Julius Jeffreys came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose.

Enrolled the Twenty-seventh day of August, in the year of our Lord One thousand eight hundred and fifty.

CROSBY

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Printers to the Queen's most Excellent Majesty. 1857.

FIG. 2.

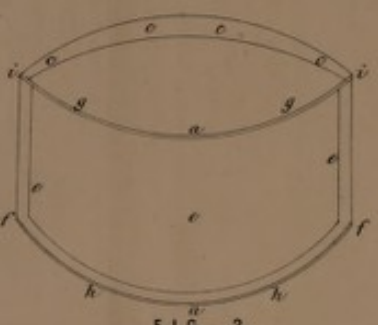


FIG. 1.

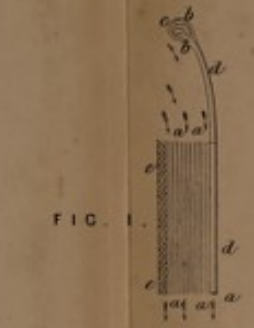


FIG. 7.

FIG. 8.

FIG. 9.

FIG. 10.

FIG. 3.

FIG. 6.

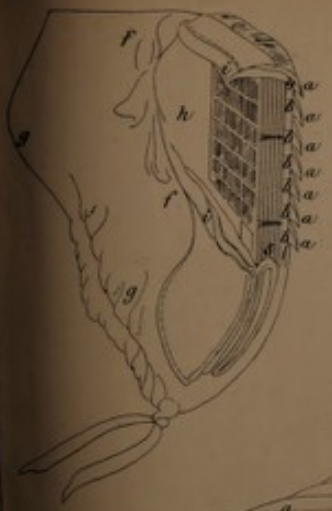


FIG. 4.

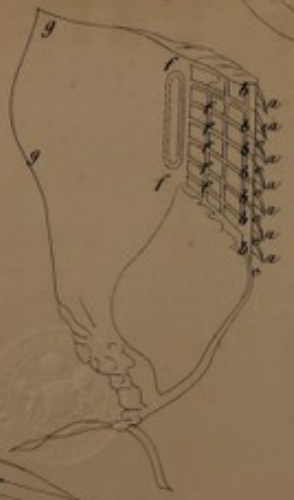
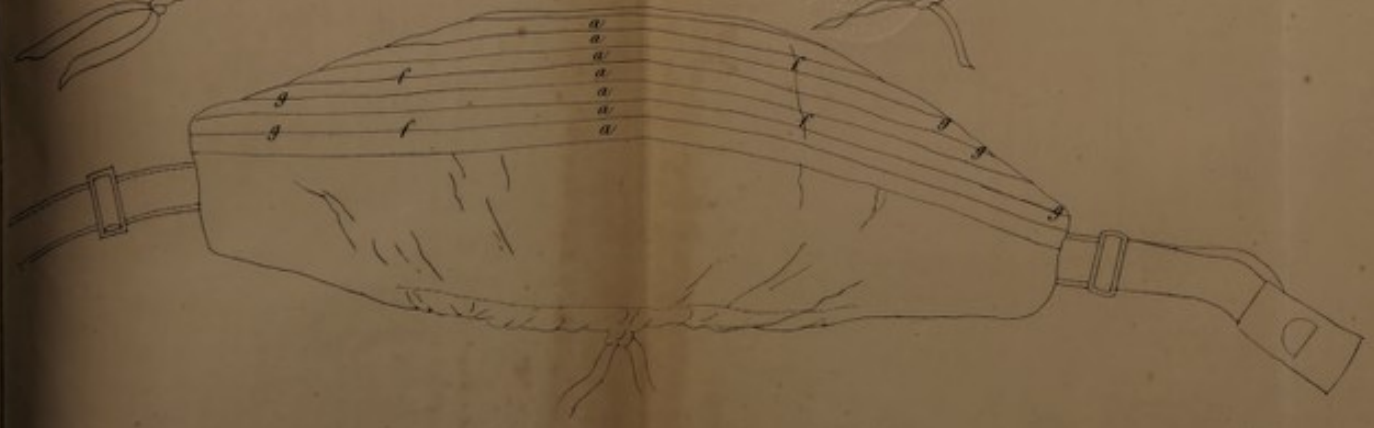


FIG. 5.



The enrolled drawing is not colored

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