Oct. 7, 1930. K. POPP 1,777,982

HOT AIR MAT

Filed June 10, 1929

Fig. 1.

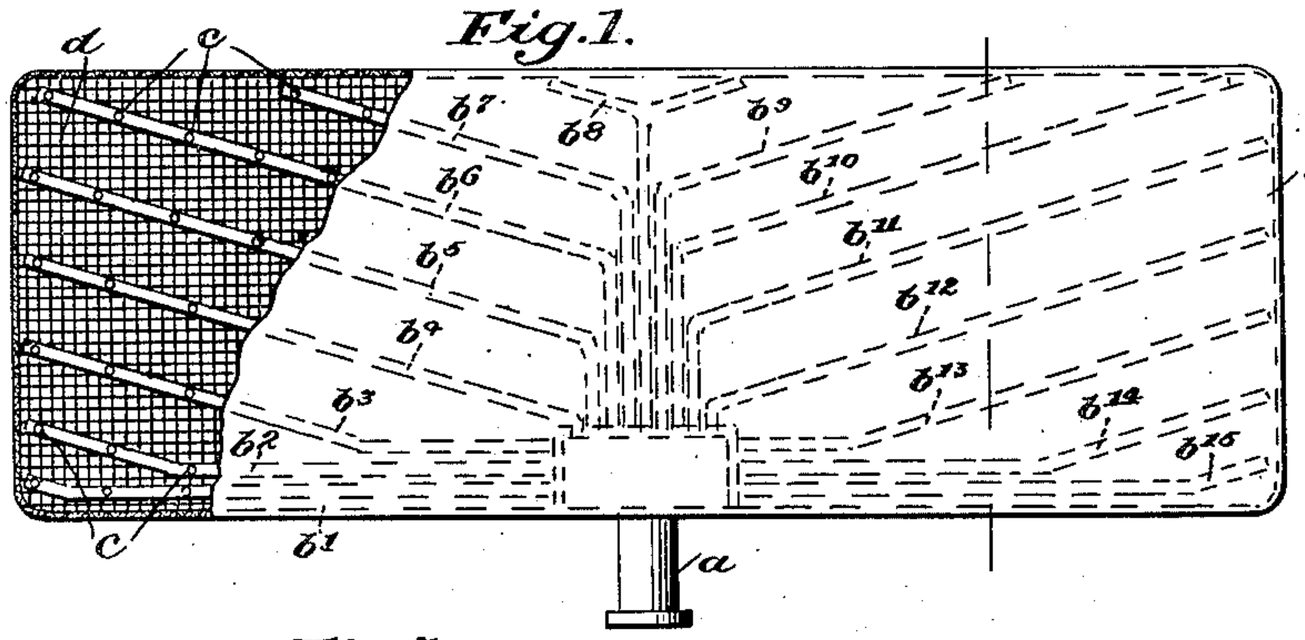



Fig. 2.

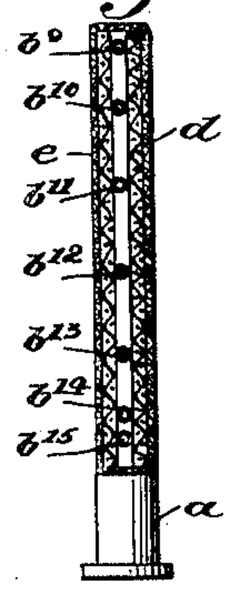



Fig. 3.

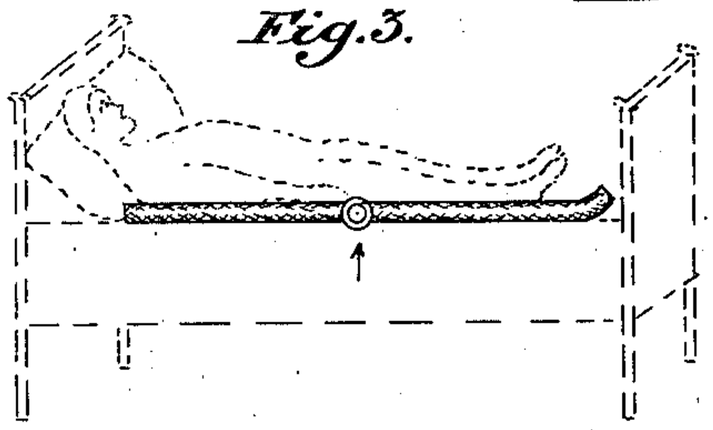


Fig. 4.

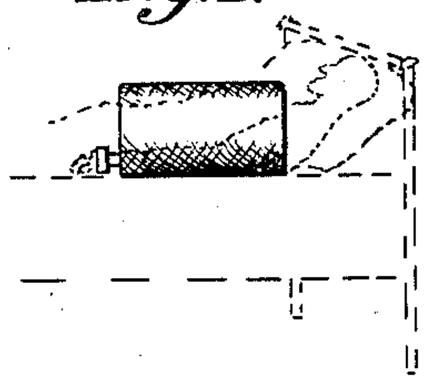


Fig. 6.

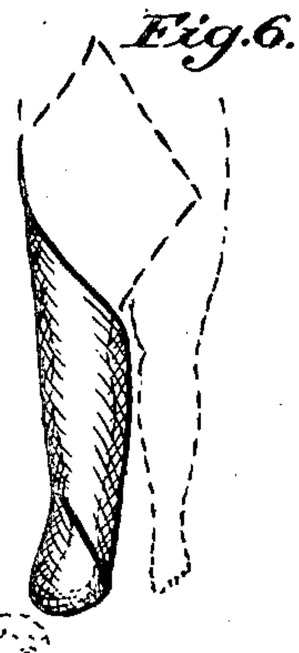


Fig. 5.

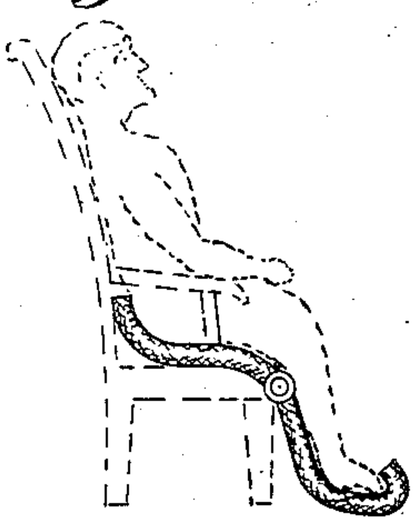


Fig. 7.

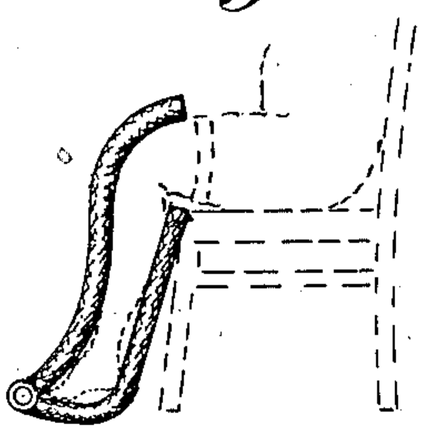


Fig. 8.

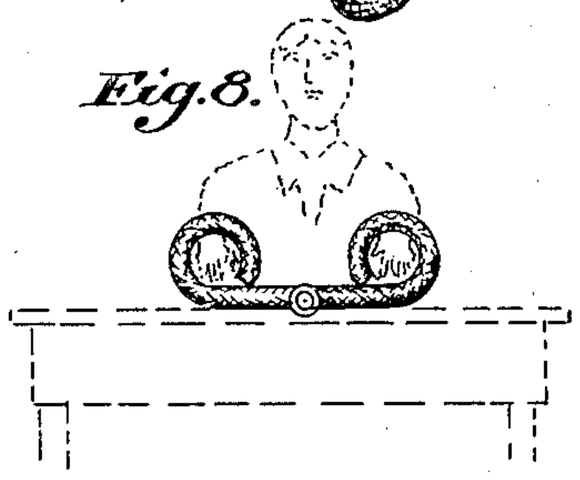


Fig. 9.

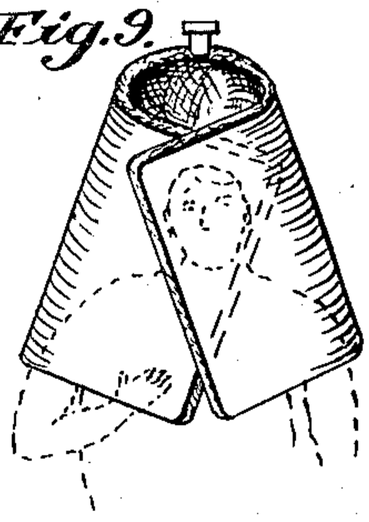
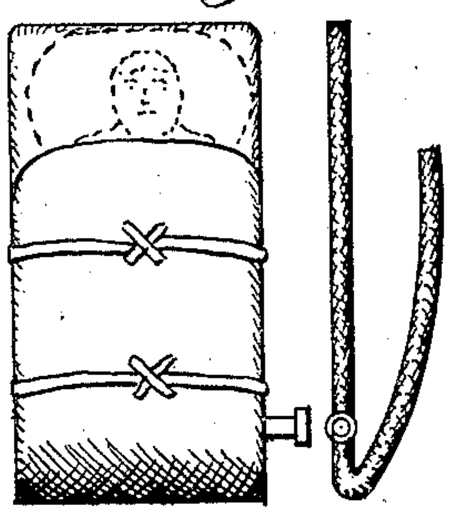


Fig. 10.



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# UNITED STATES PATENT OFFICE

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## HOT-AIR MAT

Application filed June 10, 1929, Serial No. 369,743, and in Germany February 20, 1928.

This invention relates to a hot air mat for use in the treatment of disease and also for other purposes.

The present invention seeks to remove the disadvantages of the prior art and is based, whilst avoiding any rigid frame, on the idea of placing the tube system, which was hitherto rigid and fixed to the mat, in the mat itself, in such a manner that, instead of the rigid tube according to known art referred to above, flexible metallic tubes are used and are permanently fixed inside the mat, so that their position cannot vary.

The system of tubes is fan-shaped which, in no way, hinders the rolling up or adaptability of the mat, but imparts, in the manner of the bones of a fish, and in spite of maintaining the flexibility, such a degree of permanence in shape and protection against compression, that resistance is offered to any possible outside influence.

Thus the whole of the drawbacks enumerated above are eliminated. The patient can be wrapped in the new mat as quickly and as easily as in an ordinary quilt, and also a thorough and uniform distribution of hot air is ensured, as the distance between the top and underside of the mat is maintained constant by the flexible metal pipes themselves, thereby ensuring the passage of air under all circumstances.

The metallic tubes, according to the present invention are embedded in a wire netting, whereby any heat which may naturally become stored up in the walls of the tubes is uniformly distributed and simultaneously, the certain degree of stiffness of the wire netting which exists in spite of the flexibility, prevents any sagging of the covering layer of the mattress or mat which might endanger the distribution of the air. The relatively stiff wire netting takes up uniformly the pressure of the patient's body so that the patient is not troubled by localized pressure of the fish-bone-like embedded tubing.

The present invention, however, makes use of ordinary flexible metallic tubing, in the practically rigid walls of which separate holes are provided. In this way a strictly controllable air distribution is obtained and, if necessary, by varying the distance between the holes the distribution can always be effected perfectly.

In the drawing is shown diagrammatically an embodiment of the invention.

Fig. 1 is a plan view of the improved mat, with the upper layers partly removed.

Fig. 2 is a side elevation of Fig. 1 partly in section.

Figs. 3–10 show various methods of using the mat.

The air, heated in any desired manner, enters a pipe $a$, and is thence distributed, for example into fifteen metallic tubes $b^1$—$b^{15}$ (first distribution), and then passes through specially distributed holes $c$ in the tubes (second distribution) into a hollow space formed by wire netting $d$ and a removable, washable fabric covering $e$, and in which space an additional exchange of pressures, air and heat takes place, whereupon the hot air passes out through the fabric covering in extremely fine and uniform distribution (third distribution). Both the exit and closing of the air can be effected according to requirements, on either side and in fact at any desired point. The mat fits any standard bed and any couch or standard sized sofa, whilst by means of the same warming, airing and drying and various packings and wrappings air or steam baths can be effected. Figs. 3–10 show a number of examples of use.

Fig. 3 shows the mat used as an air, hot-air or steam bath. In this arrangement the hot air mat may be used for warming, airing and drying of beds.

Fig. 4 shows a partial hot air bath for back, breast and body.

Fig. 5 shows the same arrangement for the buttocks and the two legs (also recumbent position).

Fig. 6 shows a like arrangement for one leg.

Fig. 7 shows an arrangement for the knee, lower leg and feet of both legs (also recumbent position).

Fig. 8 shows the same arrangement for both arms. Also adaptable by rolling singly for one arm only.

The arrangements according to Figs. 3–8 may also be used with suitable packings, wrappings and the like as a heat distributing layer.

Fig. 9 shows an arrangement for treating the head, neck, the wind pipes—hot air inhalation—and the shoulder, and

Fig. 10 shows the use of the mat as hot air bed for children or prematurely born children (in this case air-douch with temperature regulator).

In adidtion the mat can serve directly for warming the seats of motor cars, electric railways and the like and indirectly for heating the latter.

What I claim is:

1. A hot air mat comprising a covering, a wire netting therein, flexible metallic tubing embedded in said wire netting, a common hot-air inlet for the tubing, and means in the wall of the tubing permitting the passage of air.

2. A hot air mat comprising a porous fabric covering, a wire netting therein, flexible metallic tubing embedded in said wire netting, a common hot-air inlet for the tubing, and means in the wall of the tubing permitting the passage of air.

3. A hot air mat comprising a covering, a wire netting therein, flexible metallic tubing spread out and fixed in said netting, outlet holes in said tubing, and at least one means for supplying air to the tubing.

4. A hot air mat comprising a porous fabric covering, a wire netting therein, flexible metallic tubing spread out and fixed in said wire netting, outlet holes in said tubing, a common air chamber connected with the tubing, and means for feeding the air chamber with heated air.

In testimony whereof I have signed my name to this specification.

KARL POPP.