June 16, 1959 H. W. UHLRIG ET AL 2,890,890

ROLLABLE FAN SUPPORT

Filed Jan. 24, 1957

Fig. 1.

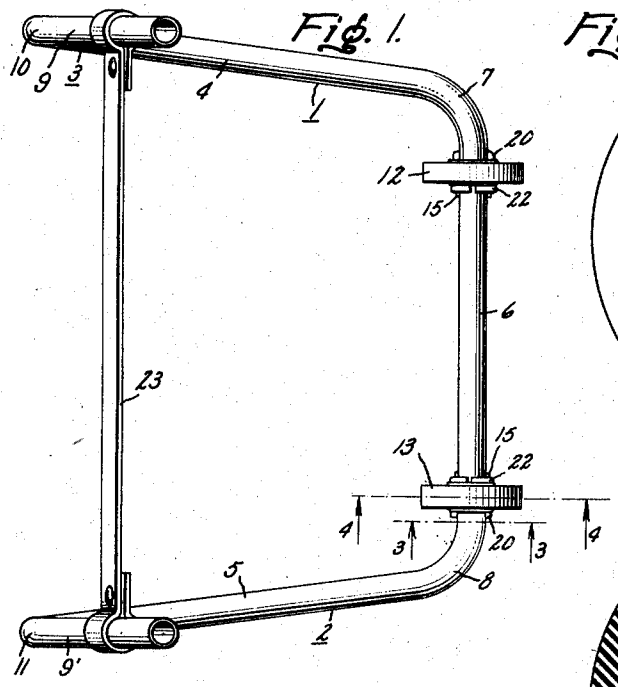


Fig. 3.

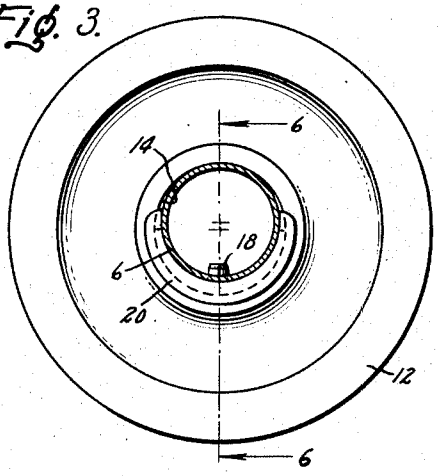


Fig. 4.

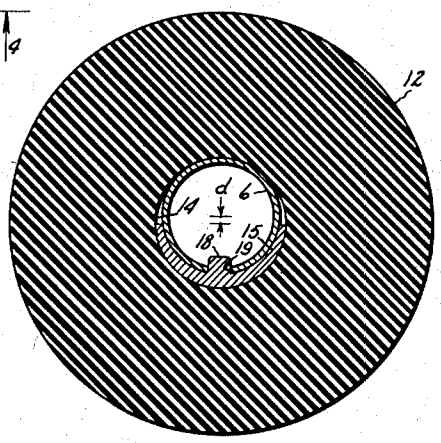


Fig. 2.

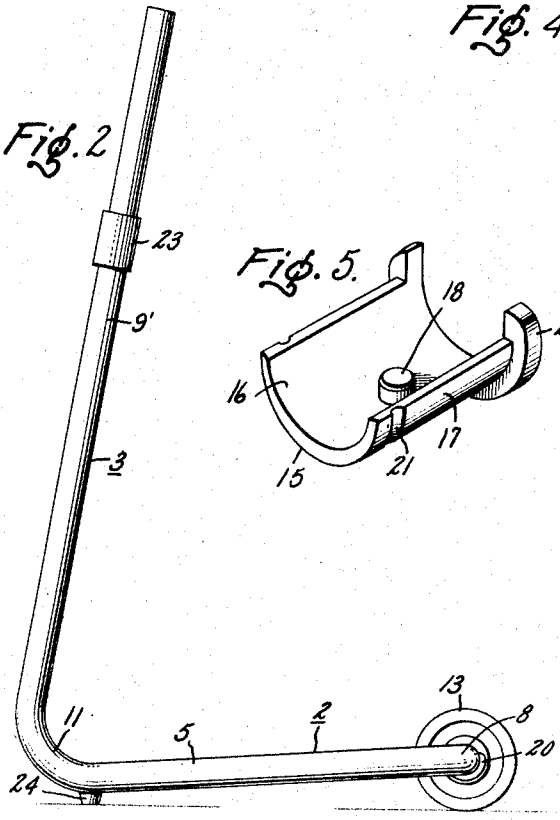
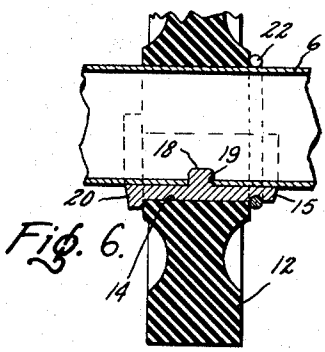


Fig. 5.

Fig. 6.



Inventors
Harry W. Uhlrig
Roy W. White
by Leonard J. Platt
Their Attorney

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ROLLABLE FAN SUPPORT

Harry W. Uhlrig, Stratford, and Roy W. White, Norwalk, Conn., assignors to General Electric Company, a corporation of New York

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4 Claims. (Cl. 280—47.12)

This invention relates to fan supports and to the method of manufacture therefor, and has particular application to tubular fan supports provided with wheels for rolling the support from one location to another location.

A conventional method of manufacturing a fan support provided with wheels is to slide each of the wheels onto a straight tube and then slip preformed bent side arm tubes over the ends of the straight tube in order to provide a support having the desired shape and dimensions. The bent side arm tubes are then connected to the straight tube by means of screws or other suitable securing means. This construction has an apparent weakness in that the joints between the straight tube and the side arm tubes may provide unwarranted flexibility and looseness. Of course, an integrally formed tubular support would not be weak at the joints and would not require the use of screws or other means for connecting tube sections to each other. However, conventional wheel arrangements could not be utilized with such an integral construction since an ordinary wheel could not be slipped around the bends in the support and then fitted to a straight tube portion of the support.

Accordingly, it is an object of this invention to provide an improved, rigid, integrally-formed, bent tubular fan support with a unique wheel arrangement.

Another object of this invention is to provide an improved method of manufacture for a rollable tubular fan support.

It is another object of this invention to provide an improved wheeled tubular fan support which is simple in structure and capable of being manufactured at low cost.

In accordance with one aspect of this invention, an integral tubular member is provided. This member includes a generally U-shaped horizontal bottom portion having two side arms and a base arm. Two curved bends connect the side arms of the U with the base arm of the U. A half sleeve bearing is fixed to the base arm of the U and a wheel having an enlarged bore is positioned on the bearing. The bore of the wheel is made large enough so that the wheel may be threaded over the bends in the tube. Thus, an improved, rigid, integrally-formed tubular fan support having a unique low cost wheel arrangement is achieved, and the problems inherent in the use of sectional tubing are obviated.

Other objects and attendant advantages of this invention will be apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a top plan view of the improved fan support;

Fig. 2 is a side elevational view of the improved fan support;

Fig. 3 is an enlarged cross sectional view of the improved wheel mounting means taken on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged cross sectional view of the improved wheel mounting means taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged perspective view showing the improved half sleeve bearing; and

Fig. 6 is a partial cross sectional view taken along the plane generally represented by line 6—6 of Fig. 3.

Referring now to Fig. 1, there is shown a tubular fan support comprising an integrally-formed tubular member 1. Tubular member 1 includes a generally horizontal bottom portion 2 and a generally vertical supporting portion 3. The bottom portion is generally U-shaped and is provided with two side arms 4 and 5 and a base arm 6. Two curved bends 7 and 8 connect side arms 4 and 5, respectively, with base arm 6 of the U. As shown in Figs. 1 and 2, vertical portion 3 includes two vertical arms 9 and 9' which are integrally connected with side arms 4 and 5, respectively, by bends 10 and 11, respectively. A fan (not shown) or other suitable apparatus may be supported by vertical arms 9 and 9'.

A new and improved means is provided for positioning wheels 12 and 13 on base arm 6 so that the support may be rolled from one location to another location. Wheels 12 and 13 may be formed of rubber or other suitable material, and preferably, the core portions thereof are formed of hard rubber for bearing purposes, while the outer peripheral tread portion thereof are formed of soft non-marking rubber. It is desired to thread the wheels over vertical arms 9 and 9', side arms 4 and 5, and curved bends 10, 11, 7 and 8. Accordingly, wheels 12 and 13 are constructed so that the bores 14 thereof have a diameter which is large enough to allow the wheels to be threaded over curved bends 7, 8, 10 and 11.

A uniquely formed and dimensioned half-sleeve bearing insert 15 is effectively utilized to take up the clearance between base arm 6 and bore 14 of wheels 12 and 13. As shown more particularly in Fig. 4, this bearing insert 15 is of special design and has an inside diameter equal to the outside diameter of the tubing and an outside diameter equal to the diameter of the bore 14 of the wheels. As shown in Fig. 4, the center of curvature of the inner surface 16 of bearing 15 is offset from the center of curvature of the outer surface 17 of bearing 15 by a distance "*d*" in order to provide a sufficiently large bearing area for the wheels. This offset distance "*d*" is preferably one-half of the difference between the inside diameter of the wheel bore 14 and the outside diameter of the tubular base arm 6 providing a bearing area for the wheel of nearly one-half of the wheel bore and a line of tangency directly opposite the bearing insert 15 between tube 6 and wheel bore 14. This line of tangency is actually surface because of manufacturing tolerances and the slight difference between the diameters of the bore and the tubular base arm 6. With this arrangement, the wheel bore is sufficiently concentric with the axis of the tubular base arm 6 to provide smooth rolling action.

An improved means is provided for connecting half sleeve bearing 15 to tubular base arm 6 and for mounting wheels 12 and 13 on half sleeve bearing inserts 15. As shown in Figs. 5 and 6, a radially extending stud 18 is provided on the inner surface 16 of bearing insert 15 for engaging with a hole 19 which is formed in base tube 6 in order to connect bearing insert 15 to tube 6. A radially outwardly extending annular flange 20 is formed on one end of half sleeve insert 15 for preventing the wheel from slipping off that end of the bearing insert. As shown in Figs. 5 and 6, a groove 21 may be formed in the outer curved surface 17 of the other end of half sleeve insert 15 for co-operating with a split ring 22 in order to confine wheels 12 and 13 on bearing 15 between flange 20 and split ring 22. By this arrange-

ment, a very simple yet effective wheel mounting means is achieved.

One of the most important advantages of the improved simplified rollable fan support is that it is so constructed that side tubular arms 4 and 5, base arm 6 and vertical arms 9 and 9' are all one piece providing the stiffness of a single piece of tubing and a consequent cost reduction by eliminating the necessity of connecting sectional tubes to each other. A unique method of manufacturing and assembling the improved fan support was made possible by the improved wheel mounting means. In manufacturing the support, a single tubular member 1 is bent to the shape shown in Figs. 1 and 2. Then two split clinch rings 22 and wheels 12 and 13 are threaded over the ends of the tube in their proper order and are placed on the center portion of base arm 6. Bearing inserts 15 are fitted to base arm 6 with studs 18 positioned in holes 19 and with flanges 20 positioned away from the center portion of base arm 6. Then wheels 12 and 13 are moved outwardly over bearing inserts 15 until they abut flanges 20, and clinch rings 22 are snapped over the bearing insert ends to engage with grooves 21. In this manner, an improved simple method of manufacture and assembly is achieved.

It is to be understood that additional strengthening members may be provided in combination with the improved fan supporting structure. For example, as shown in Fig. 1, a horizontal strap 23 may be fixed to the upper ends of vertical arms 9 and 9' if desired. As viewed in Figs. 1 and 2, the left side of the support may be provided with foot portions 24 for engaging with the floor, or if desired, such feet 24 may be eliminated to allow side arms 4 and 5 to rest on the floor.

In operation, the fan support may be rolled from one location to another location by merely lifting the left side of the support, as viewed in Figs. 1 and 2, and pulling or pushing the support so that wheels 12 and 13 rotate with respect to fixed half sleeve bearings 15 and base tube 6.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various other changes and modifications can be made therein without departing from the invention, and therefore, it is aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A rollable fan support comprising a tubular member having an integrally-formed, generally U-shaped horizontal bottom portion, said U-shaped bottom portion including two side arms and a base arm; two curved bends connecting the two side arms of the U with the base arm of the U; a half sleeeve bearing fixed to said base arm; and a wheel having a bore positioned on said half sleeve bearing and said base arm, the diameter

of said bore being large enough so that the wheel may be threaded over said curved bends.

2. A rollable fan support comprising a tubular member having an integrally-formed, generally vertical portion and an integrally-formed, generally U-shaped horizontal bottom portion, said U-shaped bottom portion including two side arms and a base arm; two curved bends connecting the side arms of the U with the base arm of the U, said vertical portion including two vertical tubular arms; two bends connecting each of the vertical arms with a respective side arm of the U; a half sleeve bearing fixed to said base arm; and a wheel having a bore positioned on said half sleeve bearing and base arm, the diameter of said bore being large enough so that the wheel may be threaded over said curved ends.

3. A rollable fan support comprising a tubular member formed integrally with a generally U-shaped horizontal bottom portion, said U-shaped bottom portion including two side arms and a base arm; two curved bends connecting the two side arms with the base arm of the U; a hole formed in said base arm; a half sleeve bearing having an inner curved surface and an outer curved surface; a stud extending radially inwardly from the inner curved surface of said half sleeve bearing positioned in said hole for fixing said half sleeve bearing to said base arm; a radially outwardly extending flange formed at one end of said sleeve bearing; a groove formed in the outer curved surface of the other end of said sleeve bearing; a wheel having a bore positioned on said half sleeve bearing between said flange and said groove; a split clinch ring positioned in said groove for co-operating with said flange to confine said wheel on said bearing, the diameter of the bore of said wheel being large enough so that the wheel may be slipped over said curved bends.

4. A wheel mounting means comprising a tubular member; a hole formed in said tubular member; a half sleeve bearing having an inner curved surface and an outer curved surface; a stud extending radially inwardly from the inner curved surface of said half sleeve bearing positioned in said hole for fixing said half sleeve bearing to said tubular member; a radially outwardly extending flange formed at one end of said sleeve bearing; a groove formed in the outer curved surface of the other end of said half sleeve bearing; a wheel having a bore positioned on said half sleeve bearing between said flange and said groove; and a split clinch ring positioned in said groove for co-operating with said flange to confine said wheel on said bearing.

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