

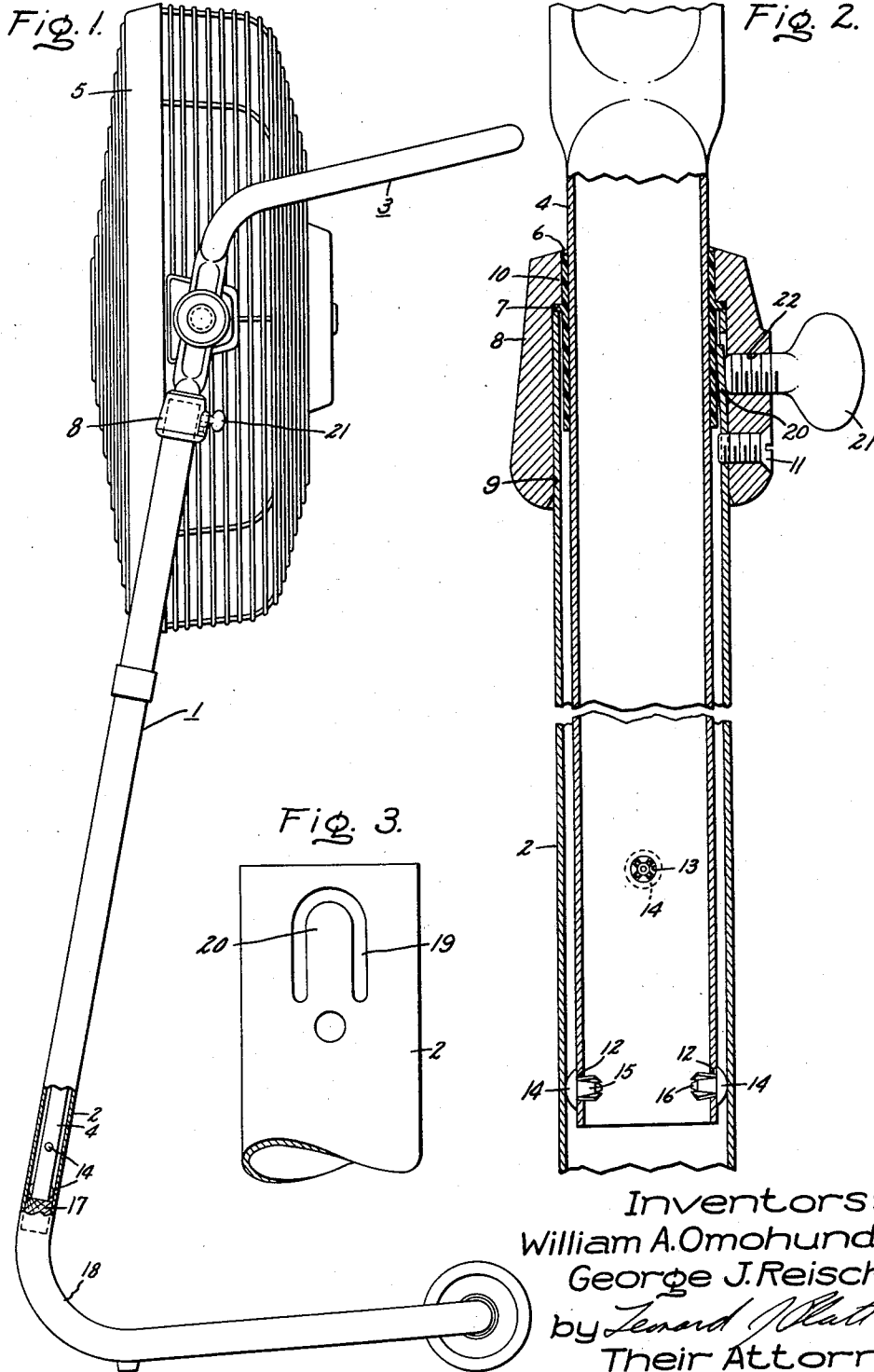
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ADJUSTABLE FAN SUPPORT

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ADJUSTABLE FAN SUPPORT

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This invention relates to fans and more particularly, to a mechanism for adjusting the height of a fan.

Fan height adjustment mechanisms with telescoping tubular supports provide a valuable addition to the fan art, but present a serious problem with respect to marring of the supports when they are telescoped one within the other. A fan which may be easily adjusted without scratching the surfaces of the tubular supports is especially desirable.

Accordingly, it is a primary object of this invention to provide an improved fan height adjustment mechanism for readily adjusting the height of a fan without marring the telescoping supporting means.

In accordance with one aspect of this invention, a first vertically arranged hollow tubular support is telescoped within a lower tubular support. A fan assembly is fixed to the upper support so that the height of the fan may be adjusted as the upper support is telescoped within the lower support. A non-metallic tubular bushing is fixed within the upper end of the lower support to slidably receive the upper support and to prevent marring thereof. A plurality of non-metallic plugs are fixed to the lower end portion of the upper support. By this arrangement, the upper support may be easily slid up and down within the lower support without marring the surface of the upper support.

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

Fig. 1 is a side elevational view of the improved adjustable fan support;

Fig. 2 is an enlarged broken detail view of the improved adjustment mechanism; and

Fig. 3 is a fragmentary view of the upper end of one of the lower tubular supports.

Referring now to Fig. 1 of the drawing, there is illustrated an adjustable fan support having a lower frame 1 comprising two generally parallel lower tubular supports 2 and an upper frame 3 comprising two generally parallel upper supports 4. The supports may be formed from steel tubing and may subsequently be painted or otherwise finished. A fan assembly 5 is suitably secured between the two parallel upper tubular supports 4.

An improved means for preventing scratching of the supports when one tubular support is telescoped within the other tubular support is provided. In the arrangement illustrated in Fig. 2, this comprises a bushing 6 formed of nylon or other suitable material. The bushing 6 is generally cylindrical in shape in order to centrally locate upper tubular supports 4 within lower tubular supports 2. A radially outwardly extending flange 7 may be integrally formed with bushing 6 in order to provide a unique means for securing bushing 6 to the upper end of support 2. The bushing 6 is inserted within the upper end of tube 2 until the lower portion of flange 7 abuts the end of the tube. In order to positively maintain the bushing in this position, a collar 8 which may be formed from metal is provided. Collar 8 is generally annular

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and is provided with a lower counter-bored portion 9 in order to provide a radially inwardly directed annular flange 10 at the upper end thereof. Annular collars 8 are placed over the outer ends of each of the tubular supports 2 with the counter-bored portions 9 thereof in contact with the outer surface of the lower tubular supports 2. The lower edge of the radially inwardly directed annular projection 10 contacts the upper edge of flange 7 in order to securely grip flange 7 between annular projection 10 and the upper edge of tubes 2. Collar 8 may then be fixed to the upper end of each of the tubular supports 2 by means of a screw 11 or other suitable securing means. As shown in Fig. 2, annular projection 10 of collar 8 also serves to back up the upper portion of relatively flexible nylon bushing 6. Preferably, bushing 6 extends upwardly at least as far as the end of the collar and may extend upwardly further than the end of the collar. By this arrangement, painted steel tubes 4 may be moved up and down inside of lower frame 2 without the paint being scraped by the upper end of lower tube 2 or collar 8.

A unique means is provided for spacing the lower end portions of each of the upper tubular supports 4 from lower tubular supports 2, and for limiting upward movement of upper tubular supports 4 with respect to lower frame 1. As shown in Fig. 2, a plurality of holes 12 are cut through the sides of each of the tubular supports 4 and a plurality of nylon plugs 14 are pressed into these holes for this purpose. As shown in Fig. 2, a plurality of holes 12 may be formed diametrically opposite to each other at the extreme lower end of inner support 4 in the plane of the greatest load and an additional pair of diametrically opposed holes 13 may be spaced upwardly approximately six inches from the first pair of holes 12 in order to provide the desired stability between upper support 4 and lower support 2. The upper pair of holes may be disposed approximately 90° with respect to the first pair of holes 12 in order to provide point contact with the inner surface of lower tubes 2 at approximately 90° intervals. It should be understood that the longitudinal spacing of the holes and the rotational spacing of the holes shown in Fig. 2 should merely be considered to be illustrative and that a fewer number of plugs or a greater number of plugs spaced on the lower end of the inner tube 4 would also prove to be effective. For example, an additional pair of plugs could be positioned longitudinally between holes 13 and 12, if desired.

Plugs 14 may be preferably formed from nylon and may be provided with a plurality of generally longitudinally arranged, radially outwardly biased fingers 15; the outer ends 16 of each of the fingers may be tapered in order to permit easy insertion within holes 12 or 13. As shown in Fig. 2, after nylon plugs 14 have been inserted in the holes, the radially outwardly biased fingers 15 hold the plugs within the holes. The head portions of nylon plugs 14 may be semi-spherical in shape in order to provide smooth contact with the inner surface of tubes 2. With this construction, it can be seen that nylon plugs 14 prevent contact between the lower portion of the inner tubular support 4 and the inner surface of outer tubular support 2. Nylon plugs 14 co-operate with bushing 6 in order to centrally position each of inner tubes 4 within outer tubes 2 to thereby prevent metal to metal contact between inner tube 4 and outer tube 2.

Positive stops for the extreme upper and lower position of inner tubes 4 with respect to outer tubes 2 are provided. In the arrangement illustrated, nylon plugs 14 positioned within upper holes 13 co-operate with bushings 6 to provide an upper stop for the upper extreme position of inner tube 4. As shown in Fig. 2, the side surfaces of upper nylons plugs 14 will contact the

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lower edge of bushing 6 in order to prevent upper tubes 4 from being removed from lower tubes 2. Thus, a stop is provided for the extreme upper position of the improved fan height adjustment mechanism. A wooden plug 17 of sufficient length may be positioned in the lower portions of each of lower tubular supports 2 in order to limit downward motion of inner tubes 4 with respect to outer tubes 2. This wooden plug 17 may be merely slipped within each of lower tubes 4 and pushed downwardly until bends 18 in the tube portions prevent further downward movement thereof. Alternatively, other suitable securing means may be utilized to affix the wooden plugs at a particular position within the lower portions of lower tubes 2. Thus, as shown in Fig. 2, downward motion of the upper frame 3 beyond the desired position is prevented by contact of the lower edge of upper tubes 4 with the upper ends of plugs 17.

One of the most important advantages of the improved simplified fan height adjustment mechanism is that it is so constructed and arranged that the fan support may be easily and quickly assembled either at the factory or by the ultimate consumer. Since a disassembled fan support may be shipped in a smaller package than an assembled fan support, transportation costs may be materially reduced by providing a fan support which may be shipped disassembled. In order to assemble the improved fan supporting mechanism, it is merely necessary to slip collars 8 and bushings 6 over the ends of inner tubes 4 and slide the collar and bushings to an extreme upper position. Then, plugs 14 may be easily snapped into holes 12 and 13 manually. The inner upper tubes 4 may then be inserted within lower tubes 2 until the ends of the upper tubes rest on wooden plugs 17. Collar 8 and bushing 10 may then be pushed downwardly so that flange 7 abuts the upper end of tube 2 and a screw 11 is inserted in the preformed holes formed in collar 8 and the outer tube. By this arrangement, a very simple fan supporting mechanism which may be easily assembled and manufactured is achieved.

Means is also provided for fixing the fan supporting mechanism in any one of an infinite number of adjustable positions. To achieve this, as shown in Fig. 3, a horseshoe section 19 may be pierced from the upper portions of the lower tubular supports 2 so as to form upwardly directed tabs 20. A thumb screw 21 or other suitable means for applying pressure is threaded through a hole 22 formed in collar 8 adjacent to tabs 20. With this arrangement, thumb screw 21 may be threaded inwardly within hole 22 to push tab 20 radially inwardly against bushing 6. If desired, tabs 20 may be removed and thumb screw 21 or other suitable pressure applying means may directly engage bushing 6. Tightening of screw 21 holds upper supports 4 in position with respect to lower supports 2 by friction between nylon bushing 6 and upper frame supports 4. Since the inner surface of nylon bushing is relatively smooth and soft, this action will not mar a painted surface on the upper frame supports 4.

Operation

To adjust the height of fan assembly 5, it is merely necessary to loosen thumb screws 21, grip upper frame 1 and move upper tubular supports 4 up or down within the lower tubular supports 2. During this movement, nylon plugs 14 and bushing 6 coact with each other to effectively space inner tubes 4 away from outer tubes 2 so that metal to metal contact and marring of the painted surfaces of inner steel tubes 4 is prevented. When the desired height of the fan assembly 5 is obtained, thumb screws 21 are tightened to hold the fan assembly in position.

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

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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 fan height adjustment mechanism comprising a first vertically arranged hollow tubular fan support having an open upper end, a second vertically arranged tubular fan support having a lower end portion, said second vertically arranged support being mounted in telescoping relation within said first tubular support, a non-metallic tubular bushing fixed within the upper end of said first support to slidably receive said second support to thereby space the second support from the upper end of said first support, and a plurality of plugs fixed to the lower end portion of said second tubular support to thereby space the lower end portion of said second tubular support away from said first tubular support, said plugs being arranged with respect to said supports such that they restrict transverse movement of said second support in any direction towards said first support and prevent said first support from marring the outside surface of said second support.

2. A fan height adjustment mechanism comprising a first vertically arranged hollow tubular fan support having an open upper end, a second vertically arranged tubular fan support having a lower end portion, said second vertically arranged support being mounted in telescoping relation within said first tubular support, a non-metallic tubular bushing fixed within the upper end of said first support to slidably receive said second support to thereby space said second support from the upper end of said first support, an outwardly extending annular flange formed integrally with said bushing for contacting the upper edge of said support, an annular collar positioned over the end of said support, an inwardly directed annular projection formed on said collar for contacting the upper edge of the flange, means for securing said collar to said tubular support to thereby fix the bushing to said first tubular support with the annular flange positioned between the end of the first support and the annular projection formed on said collar, and a plurality of non-metallic plugs fixed to the lower end portion of said second tubular member to thereby space the lower end portion of said second tubular support away from said first tubular support, said plugs being arranged with respect to said supports such that they restrict transverse movement of said second support in any direction towards said first support and prevent said first support from marring the outside surface of said second support.

3. A fan height adjustment mechanism comprising a first vertically arranged hollow tubular fan support having an open upper end, a second vertically arranged tubular fan support having a lower end portion, said second vertically arranged support being mounted in telescoping relation within said first tubular support, a non-metallic tubular bushing fixed within the upper end of said first support to slidably receive said second support to thereby space the second support from the upper end of said first support, a plurality of nylon plugs fixed to the lower end portion of said second tubular support to thereby space the lower end portion of said second tubular support away from said first tubular support, said plugs being arranged with respect to said supports such that they restrict transverse movement of said second support in any direction towards said first support, and prevent said first support from marring the outside surface of said second support, a lanced-out tab formed in said first tubular support at the upper end thereof adjacent to said bushing, a collar positioned over the end of said first tubular support and fixed thereto, a thumb screw threaded through said collar for engaging said tab whereby said tab may be moved radially inwardly to press against said bushing to thereby fix the second support in an adjusted position with respect to said first support in order to lock the fan assembly in adjusted position.

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4. A fan height adjustment mechanism comprising a first pair of vertically arranged hollow tubular fan supports having an open upper end, a second pair of vertically arranged tubular fan supports having lower end portions, said second pair of vertically arranged supports being mounted in telescoping relation within said first pair of vertically arranged supports, a pair of non-metallic tubular bushings fixed within the upper end portions of each of said first supports in order to slidably receive said second pair of supports to thereby space said second pair of supports away from the upper end of said first pair of supports, and a plurality of plugs fixed to the lower end portions of each of said second pair of tubular supports to thereby space the lower end portions of said second pair of tubular supports away from said first tubular support, said plugs being arranged with respect to said supports such that they restrict transverse movement of said second supports in any direction towards said first supports and prevent said first supports from marring the outside surfaces of said second supports.

5. A fan height adjustment mechanism comprising a first vertically arranged hollow tubular support having an open upper end, a non-metallic tubular bushing positioned in the upper end of said support, an outwardly extending annular flange formed integrally with said bushing for contacting the upper edge of said support, an annular collar positioned over the end of said support, an inwardly directed annular projection formed on said collar for contacting the upper edge of the flange, means for securing said collar to said first tubular support to thereby fix the bushing to the upper end of said first support with the annular flange securely held between the end of the support and the annular projection, and a second vertically arranged tubular support slidably positioned within said first tubular support.

6. A fan height adjustment mechanism comprising a first vertically arranged hollow tubular fan support having an open upper end, a second vertically arranged tubular fan support mounted in telescoping relation within the open upper end of said first tubular support, a non-metallic tubular bushing having an upper surface, said bushing being located between the upper inside surface of said first support and the outside surface of said second support to thereby space said second support from the upper end of said first support, an outwardly extending annular flange formed integrally with said bushing

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for contacting the upper edge of said first support, an annular collar positioned over the end of said first support, an inwardly directed annular projection formed on said collar for gripping the upper edge of the flange to thereby fix the bushing to said first tubular support with the annular flange securely held between the end of the support and the annular projection formed on said collar, the upper surface of said bushing extending upwardly to the end of said collar whereby to prevent the upper end of said collar from marring the outside surface of said second vertically arranged support.

7. A fan height adjustment mechanism comprising a first vertically arranged hollow tubular fan support having an open upper end, a second vertically arranged tubular fan support mounted in telescoping relation within the open upper end of said first tubular support, a non-metallic tubular bushing having an upper surface, said bushing being located between the upper inside surface of said first support and the outside surface of said second support to thereby space said second support from the upper end of said first support, an outwardly extending annular flange formed integrally with said bushing for contacting the upper edge of said first support, an annular collar positioned over the end of said first support, an inwardly directed annular projection formed on said collar for gripping the upper edge of said flange to thereby fix the bushing to said first tubular support with the annular flange securely held between the end of the first support and the annular projection formed on said collar, a lanced out tab formed in said first tubular support at the upper end thereof adjacent to said bushing below said flange, and a pressure applying means for moving said bushing inwardly to thereby fix the second support in an adjusted position with respect to said first support.

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