United States Patent [19]

Celebonovic

[11] **3,822,837**

[45] **July 9, 1974**

[54] **METHOD OF FIXING A CYLINDRICAL OBJECT HAVING A CENTRAL HOLE, AND SUPPORT THEREFOR**

[75] Inventor: **Stevan Celebonovic**, Geneva, Switzerland

[73] Assignee: **ROLPA S.a.r.l.**, Carouge-Geneva, Switzerland

[22] Filed: **Mar. 3, 1972**

[21] Appl. No.: **231,604**

[30] **Foreign Application Priority Data**

Mar. 12, 1971 Switzerland 3668/71

[52] **U.S. Cl.** **242/72.1**

[51] **Int. Cl.** **B65h 75/24**

[58] **Field of Search** 242/55, 68.3, 72, 72.1

[56] **References Cited**

UNITED STATES PATENTS

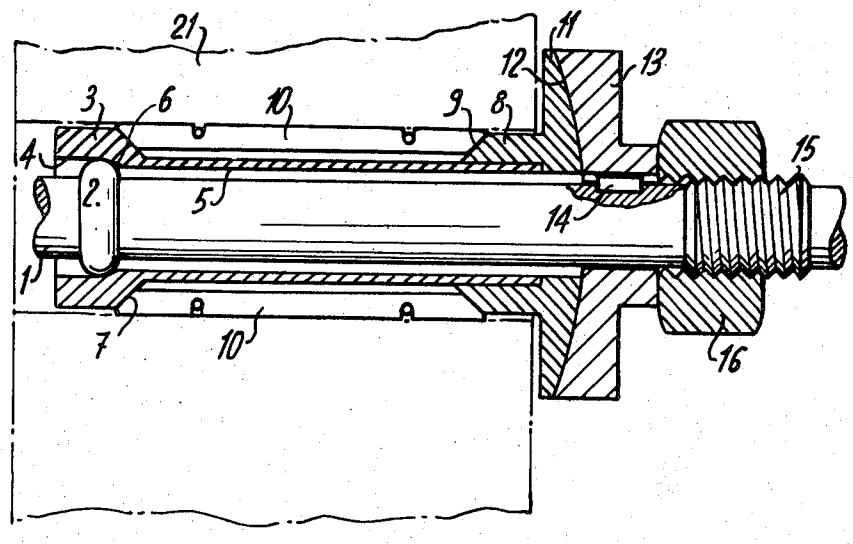
2,280,370	4/1942	Bennett	242/72.1
2,297,648	9/1942	Cushman	242/72.1
2,412,551	12/1946	Pratt	242/55 X
2,443,243	6/1948	Hayssen	242/72.1
3,197,153	7/1965	Davidson	242/22

Primary Examiner—John W. Huckert
Assistant Examiner—Edward J. McCarthy
Attorney, Agent, or Firm—Emory L. Groff; Emory L. Groff, Jr.

[57] **ABSTRACT**

The object, e.g. a roll of paper, is fixed on a central tubular support provided with a shaft. The orientation of the axis of the object can be modified with respect to that of the shaft and the object locked on the support in the position corresponding to the desired orientation. The object rests by one of its flat surfaces on a guide perpendicular to the axis of the support, and the object is locked on the support, so that the axis of the shaft and that of the object are parallel.

5 Claims, 2 Drawing Figures



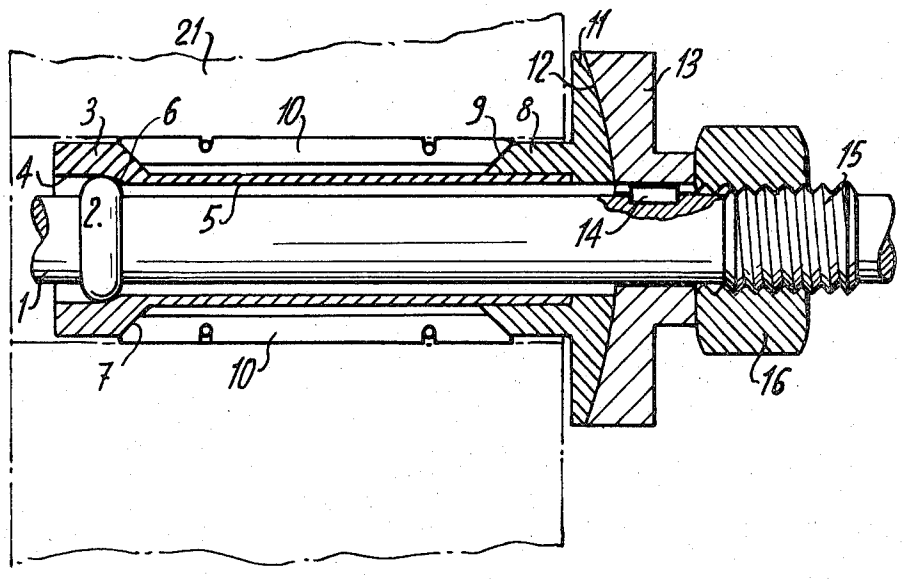


FIG. 1

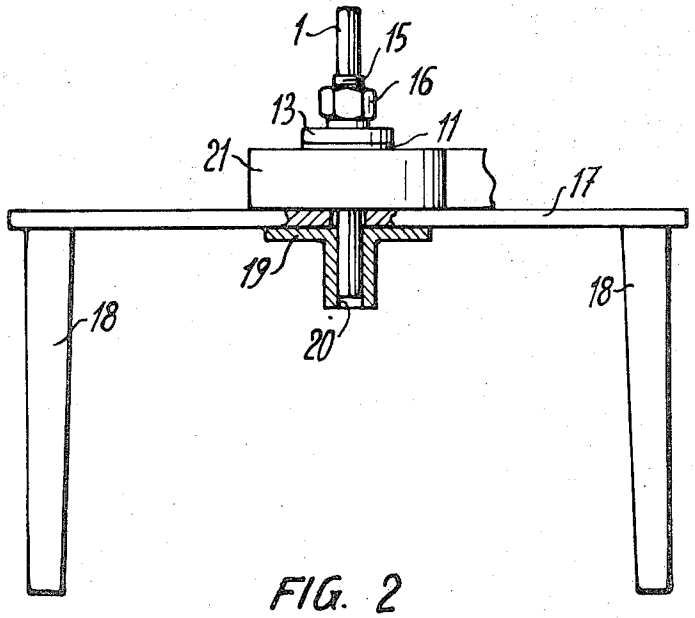


FIG. 2

METHOD OF FIXING A CYLINDRICAL OBJECT HAVING A CENTRAL HOLE, AND SUPPORT THEREFOR

The present invention relates to a method of fixing a cylindrical object having a central hole and to a support for the application of this method.

Certain cylindrical objects, especially rolls of paper, must be placed on a central support provided with a shaft in order to be unwound. In the case of rolls of paper especially, it frequently happens that the geometrical axis of the roll does not coincide with that of the support, and as a result in the course of unrolling the roll does not run true.

It is an object of the invention to facilitate the positioning of a cylindrical object on a central support and to enable excellent parallelism between the axis of this object and that of the support to be obtained without difficulty.

According to the invention, there is provided a method of fixing a cylindrical object having a central hole, especially a roll of paper, on a central support provided with a shaft, characterized in that it uses a support enabling the orientation of the axis of the object with respect to that of the shaft to be modified and the locking of the object on the support in the position corresponding to the desired orientation, in that the object is positioned so that it rests by one of its flat surfaces on a guide perpendicular to the axis of the support and in that the object is locked on the support, so that parallelism between the axes of the shaft and of the object is obtained.

The invention also comprises a support for the application of this method. This support is characterized in that it comprises a shaft and a body of generally tubular shape, movable so as to enable the orientation of its axis with respect to the axis of the shaft to be modified, locking means enabling the fixing in a desired position of said body with respect to the shaft.

In order that the invention may be more fully understood, one embodiment of a support used for the application of the method according to the invention is described below with reference to the accompanying diagrammatic drawing, given of course purely by way of illustrative and non-limiting example, in which:

FIG. 1 is a longitudinal section of said support; and

FIG. 2 shows, on a larger scale, a table enabling the positioning of a roll on said support.

Referring to FIG. 1, the support comprises a shaft 1 having an annular beading 2 serving as a bearing at the end of a tube 3. For this purpose, the inner bore of the tube 3 has a portion 4 of larger diameter at its end, this portion being connected to the inner wall 5 of the tube by a surface 6 in a shape of a spherical zone whose center is situated on the axis of the shaft 1.

This end of the tube 3 has on its outer portion a frustoconical surface 7. At its other end, the tube 3 bears a sliding sleeve 8 having also a frustoconical surface 9. Concave rods or plates 10 are supported at each of their ends against the frustoconical surfaces 7 and 9 and constitute an expandable hub, since any movement tending to bring the two said frustoconical surfaces together has the effect of moving the rods 10 radially outwards.

The sleeve 8 has a head 11 having a spherical surface 12 which is arranged facing a corresponding surface

provided in a part 13 slidable on the shaft 1, but made angularly fast to the latter by a key 14. The shaft 1 also has an externally threaded ring 15 which is rigidly fixed to this shaft and which serves as a screw for a nut 16.

The use of the support described is very simple, as seen in FIG. 2. A table 17, supported by feet 18, has a central orifice extended by a guide part 19 fixed in any suitable manner to the table. This guide part has a bore 20 of diameter corresponding to that of the shaft 1 and whose axis is strictly perpendicular to the upper surface of the table 17. When a roll, for example of paper, has to be positioned on the rotary support, this roll 21 is firstly placed on the table 17 so that its central hole is opposite the bore 20. The support is then introduced into the central hole of the paper and the shaft 1 penetrates into the bore 20. The axis of the shaft 1 is therefore strictly perpendicular to the lateral surface of the roll which rests on the table. The nut 16 is then tightened, which moves the part 13 and hence the sleeve 8 towards the left of FIG. 1. This movement of the sleeve 8 causes a radial movement of the rods 10 which are flattened against the wall of the central hole of the roll 21. If the wall is not true with respect to the geometrical axis of the roll, one of the rods 10 comes into contact with the wall before the others and causes a lateral displacement of the tube 3 which can pivot around the center of its spherical surface 6.

By continuing to tighten the nut 16, all the rods 10 are applied against the wall of the central hole of the roll, the axis of orientation of these rods corresponding to that of this central hole, and the roll is thus locked in rotation with the shaft 1. The friction between the head 11 and the part 13 is sufficient to avoid any accidental movement of these two parts with respect to one another during the use of the roll mounted on the shaft 1. There is thus obtained an easy and regular unwinding of the roll 21.

In a modification, the hole between the parts 11 and 13 could be further improved by providing on the latter one or several threaded holes enabling the screwing-in of at least one locking screw whose end would come into contact with the head 11.

The method described has been provided to enable the easy fixing of rolls of paper on a central support provided with a shaft, but it is clear that it could be used advantageously for an object of substantially corresponding shape which must be fixable in a very accurate position on a rotary shaft.

Of course, numerous structural modifications of the support can be contemplated. In particular, the tube 3 could be hinged to the shaft 1 by means of a universal joint, for example of the cardan type.

In another modification, the part 13, which serves for the locking of the head 11, could have a greater diameter than the latter and have a surface perpendicular to the axis of the support, this surface serving as the bearing for a flat surface of the cylindrical object or roll 21. In this way, parallelism between the axes of the roll 21 and of the support can be obtained simply by pulling down a lateral surface of the roll against the locking part, without having to use a table provided with a guide for the shaft of the support.

I claim:

1. In a method of securing a cylindrical object, such as a roll of paper having a central opening, to a support including a shaft surrounded by an expandable tubular

locking device, a table having an opening and a guide member also having an opening and disposed perpendicular to the plane of the table, the openings in said table and guide member being in alignment with each other, one end of said shaft fitted in said respective openings and projecting beyond the plane of said table, the steps comprising: (1) placing a roll of paper on said table with the wall of its central opening surrounding said shaft but spaced therefrom, (2) positioning said expandable tubular locking device within said central opening in the roll of paper and around said shaft so as to be rotatable therewith, and (3) manipulating said locking device to expand it and grip the wall of the opening in the roll of paper and secure the locking device in its expanded position with the axis of the shaft and the axis of said roll of paper being oriented in parallelism regardless of any irregularities in the geometric axis of said roll of paper.

2. In a support for a roll of paper which has a central opening, means to insure parallelism between the geometrical axes of said support and said roll of paper to provide accurate unrolling of said paper, said means comprising a shaft, a body of generally tubular shape surrounding said shaft, said body and shaft extending substantially throughout the length of said central opening, said body being movable radially of said central opening so as to modify the orientation of its axis with respect to the axis of said shaft, and means locking said body in the desired position relative to said shaft and the wall of said central opening.

3. The support of claim **2** wherein said body includes a slidable sleeve on its outer end, a head on the outer end of the sleeve and a frusto-conical surface on the inner end of said sleeve, the inner end of said body including an enlarged end portion having a frusto-conical surface, and an expandable hub including a plurality of rods on said body between said respective frusto-conical surfaces.

4. The support of claim **3** including a locking member slidably and non-rotatably mounted on said shaft adjacent said head, said head having an inner surface and an outer surface, and means for actuating said locking member.

5. The support of claim **4** wherein said means for actuating said locking member comprises an externally threaded ring on said shaft, a nut threadedly mounted on said ring adjacent said locking member whereby when said nut is tightened it engages said locking member pressing it against the outer surface of said head moving said sleeve inwardly which causes said hub rods to expand against the wall of the central opening in said roll of paper and forces the inner surface of said head against a flat side of said roll of paper thereby locking said shaft and said roll of paper in rotatable engagement with each other.

* * * * *