Dec. 2, 1924. 1,518,026

A. C. VAN SLUYS

EXPANSION ARBOR

Filed April 23, 1924

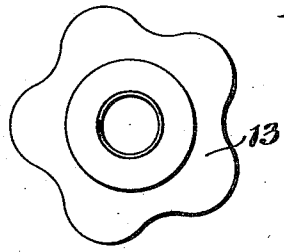


Fig. 6.

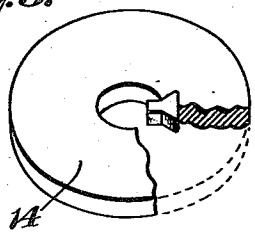


Fig. 5.

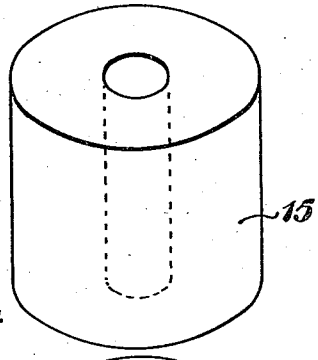


Fig. 4.

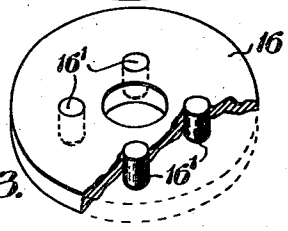


Fig. 3.

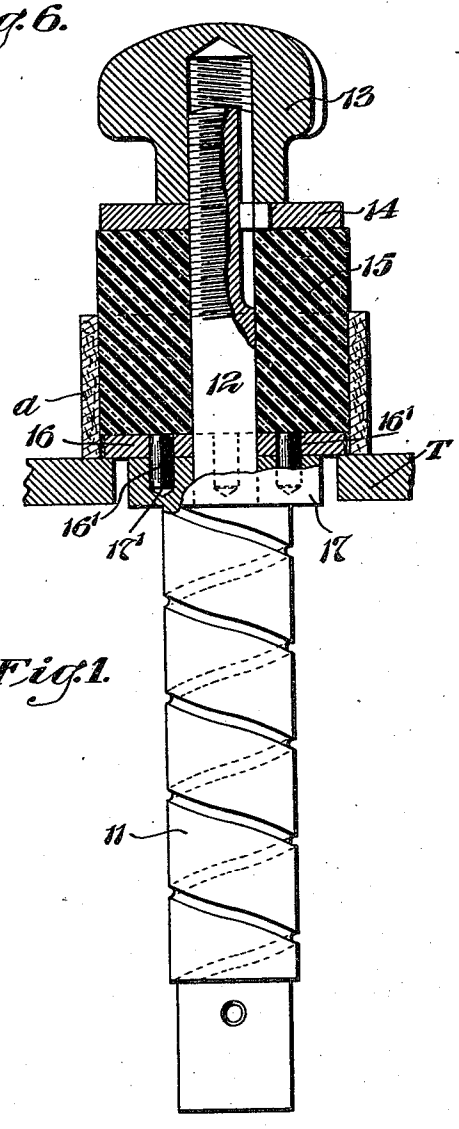


Fig. 1.

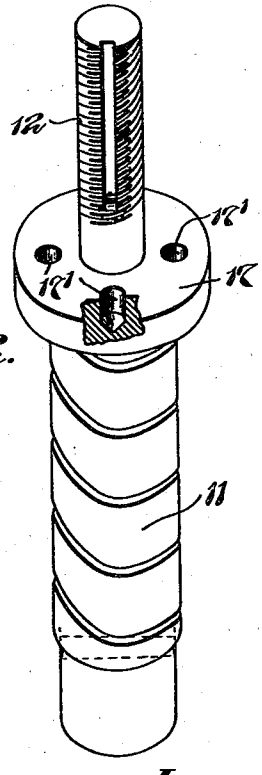


Fig. 2.

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UNITED STATES PATENT OFFICE.

ADOLPH C. VAN SLUYS, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR TO NASHUA GUMMED & COATED PAPER COMPANY, OF NASHUA, NEW HAMPSHIRE, A CORPORATION OF MASSACHUSETTS.

EXPANSION ARBOR.

Application filed April 23, 1924. Serial No. 708,589.

To all whom it may concern:

Be it known that I, ADOLPH C. VAN SLUYS, a citizen of the United States, and resident of Nashua, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Expansion Arbors, of which the following is a specification.

This invention relates to mechanism for transmitting rotary motion from a shaft or spindle to a tubular member removably mounted thereon, and has particular reference to such mechanism or devices employed for winding strips of sheet material, such as gummed or coated paper or cloth, on cores of pasteboard.

The object of my invention is to provide a rotary arbor having an expansion member for frictionally engaging a core removably mounted thereon and having means whereby changes may be readily and quickly made to enable the arbor to be employed for rotating any one of a number of cores which widely vary in diameter.

To this end, my invention consists in the construction and combination of parts substantially as hereinafter described and claimed.

Of the accompanying drawings:—

Figure 1 is a sectional side elevation of a complete expansion arbor embodying my invention.

Figures 2, 3, 4 and 5 are perspective views of different members of the arbor.

Figure 6 is an under plan view of the compression nut or knob.

Similar reference characters indicate similar parts in all of the views.

A shaft 11 having an externally threaded stem 12 is, in practice, mounted in a suitable bearing not necessary to illustrate, and is rotated by any suitable means as by a belt mounted on a pulley of the shaft. Said shaft is illustrated as having an external groove for oil for lubricating purposes. As illustrated by Figure 1, the shaft is vertical and its upper portion (including the stem 12) extends through an opening in a table or platform a portion of which is indicated at T. It is to be understood however that I do not limit myself to use of the device in such position. For some purposes the shaft might be mounted to rotate on a horizontal axis.

Removably engaging the threaded upper end of the shaft stem 12 is an internally threaded nut or knob 13, said knob bearing on a disk or plate 14, the latter having a splined connection with the stem 12 so that it must rotate with but can be adjusted longitudinally of the said stem.

The disk or plate 14 bears on an expansion member 15 which is preferably a cylindrical block of rubber having a central bore fitting the stem 12, and the said member 15 is supported by a disk or plate 16 loosely mounted on the stem 12 and having pins 16′ removably engaging holes 17′ in a collar 17 which is integral with or rigidly connected with the shaft 11. As shown by Figure 1, the member 15 is supposed to be under some compression between the disks 14, 16, and therefore somewhat expanded radially so as to frictionally engage the interior of the core *a* shown as mounted thereon.

In practice, one end of a strip of the material to be wound on the core *a* is attached to said core adhesively or otherwise, and then the shaft is driven to wind the strip on the core. Upon starting any winding on a new core, the parts are operated to first permit the expansion member to contract, and such new core is dropped over it to position with its lower edge bearing on the table T. Then the nut 13 is turned to cause the disk 14 to bear on the member with pressure enough to effect expansion of the member 15 into frictional contact with the core, after which the winding can be started. Upon completion of the winding, turning of the nut 13 in the reverse direction will permit the member 15 to contract so that the core and the coiled strip thereon can be removed. The nut 13 is of lesser diameter than the member 15 and the core *a* so that said core can always be removed or put in place without requiring removal of any parts of the device itself. A slight turning of the nut 13 in one direction or the other is all that is required.

An important feature of my invention consists in the disk or plate 16 which is separably connected with the shaft as by means of the pins 16′ of the disk removably engaging the holes 17′ of the collar 17. This enables the device to be equally as well used for winding on large cores as small ones. For instance, when the winding is to be done on a core larger than the one illustrated,

the nut 13 is removed and the disks 14 and 16 and the member 15 are slipped off. Then a disk 16 of larger diameter but having pins 16′ so located as to fit the holes of the collar 17 is mounted in place, a member 15 of required larger diameter is fitted to place, and preferably a disk 14 of larger diameter is slipped onto the stem 12, and the nut 13 then replaced.

The reason for using a disk 16 of larger diameter and preferably also the upper disk 14, is that a better engagement of the member 15 with the core is effected when the disks are of nearly the diameter of the member 15 than if said disks were considerably smaller. If the disk 16 is much smaller than the member 15, the latter, when of rubber and under compression, would squeeze down somewhat around the edges of the disk. In other words, a rubber block such as illustrated, when longitudinally compressed between two disks and consequently radially expanded, presents a more uniform cylindrical surface when the three are of nearly the same diameter than when the disks are much smaller than the block. For this reason it is desirable to use disks of different sizes as well as expansion members of different sizes for different diameters of cores on which the strips are to be wound.

When the device is used as illustrated by Figure 1, it is important that the top of the collar 17 of the shaft shall be substantially flush with the top of the table T not only to enable the disk 16 to extend more or less out beyond the margin of the hole in the table regardless of the diameter of said disk, but also to enable the top of the table to furnish the stop for arresting the core *a* in proper position when said core is dropped to place for starting a winding operation.

I do not limit myself to the employment of a single expansion member 15. If the core *a* on which the sheet material is to be wound is a long one, there may be a plurality of disks 14 alternating with a plurality of expansion members 15. In such case, all of the disks will be positively connected with the shaft so as to be rotated by the shaft without effecting any torsional strain on the expansion member or members. In the structure as illustrated, the disk 14 is positively driven by the shaft, owing to the splined connection therewith, and the disk 16 is positively driven by the shaft owing to the pin connection with the holes of the shaft collar 17.

Having now described my invention, I claim:—

1. A rotatable shaft having means for removably connecting a disk therewith, a second disk movable longitudinally of the shaft and having splined connection therewith, an elastic member on the shaft between the two disks, and means for actuating said second disk to longitudinally compress and radially expand said elastic member to cause it to frictionally engage the interior of a core.

2. A device of the character described, comprising a shaft having two disks connected to rotate therewith, one of said disks being adjustable relatively to the other, and an elastic block confined between the two disks and adapted to be expanded to frictionally engage the interior of a core.

3. A device of the character described, comprising a shaft having two disks connected to rotate therewith, one of said disks being movable longitudinally of the shaft, a nut having threaded engagement with the shaft to adjust the longitudinally movable disk, and an elastic block confined between the two disks and adapted to be expanded to frictionally engage the interior of a core, said nut being of lesser diameter than the said elastic block and adjustable disk.

4. A device of the character described, comprising a shaft having a collar provided with holes, a disk mounted on the shaft and having pins engaging the holes of said collar, an elastic block bearing at one end against said disk and adapted to be expanded to frictionally engage the interior of a core, and an adjustable disk bearing against the other end of said block.

5. The combination with a horizontal support having a hole, a vertical shaft extending through said hole and having its portion above said support provided with an elastic block and means for expanding said block, said block having a diameter exceeding the diameter of the hole in the support whereby an arbor dropped over the elastic block may be arrested in position for operation by the top of said support around its hole.

In testimony whereof I have affixed my signature.

ADOLPH C. VAN SLUYS.