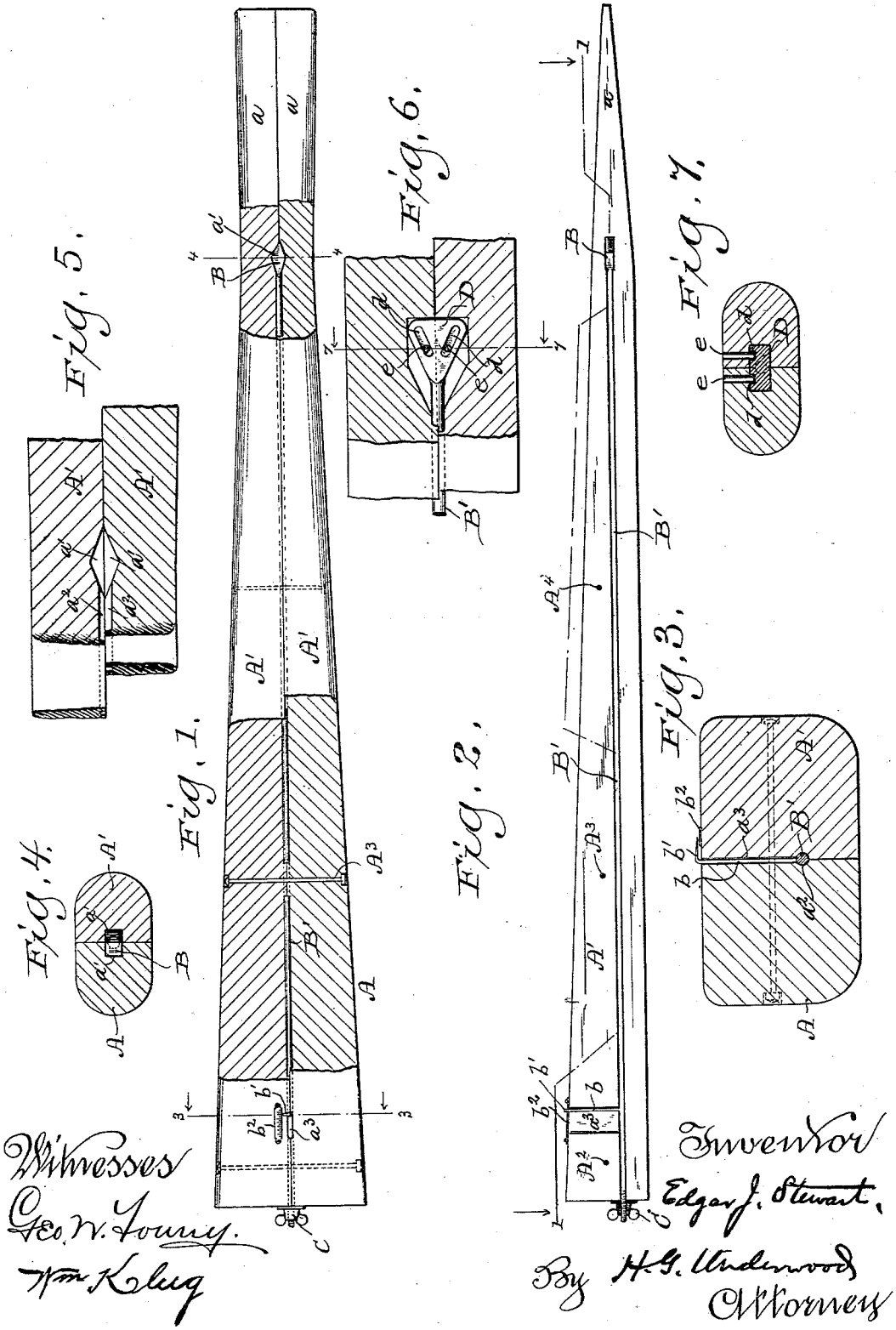
(No Model.)

E. J. STEWART.

EXPANSIBLE MANDREL.

No. 458,351. Patented Aug. 25, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

EDGAR J. STEWART, OF SHEBOYGAN, WISCONSIN.

EXPANSIBLE MANDREL.

SPECIFICATION forming part of Letters Patent No. 458,351, dated August 25, 1891.

Application filed March 12, 1891. Serial No. 384,799. (No model.)

To all whom it may concern:

Be it known that I, EDGAR J. STEWART, a citizen of the United States, and a resident of Sheboygan, in the county of Sheboygan, and in the State of Wisconsin, have invented certain new and useful Improvements in Expansible Mandrels; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in mechanism for the manufacture of packing-tubes for bottles, &c., of the same general construction as that shown in United States Patent No. 430,325, granted to me June 17, 1890, and relates more particularly to a device for adjusting or expanding the mandrel over which said tubes are formed, whereby tubes of several different sizes may be made upon one mandrel by simply adjusting the mandrel so as to conform in size to the size of the bottle to be inclosed in the wrapper or tube.

In the accompanying drawings, illustrating my invention, Figure 1 is a plan view of my improved expansible mandrel with parts broken away to show the adjusting mechanism. Fig. 2 is a side elevation of one-half of the mandrel. Fig. 3 is an enlarged cross-section on line 3 3 of Fig. 1. Fig. 4 is a cross-sectional view taken on line 4 4 of Fig. 1. Fig. 5 is a view, partly in section, illustrating the formation of the inclined faces upon the two halves of the mandrel. Fig. 6 is a similar view illustrating modified form of the mechanism for adjusting the mandrel. Fig. 7 is a cross-section on line 7 7 of Fig. 6.

In said drawings, A indicates the mandrel, preferably consisting of two halves A′ A′, which are each suitably rounded upon one side to give a proper shape to the tube which is formed over it and upon its opposite side made straight, as shown more particularly in Fig. 2. The two halves A′ A′ are placed with their flat or straight sides together, and secured together in any convenient manner—as, for instance, by the bolts A^2 A^3 A^4. Recesses a' a' are formed in the adjacent surfaces of the two halves A′ A′ of the mandrel, near the adjustable or delivery ends a a thereof, said recesses a' a' being formed with inclined or oblique sides, as shown in Figs. 1 and 5. A wedge B is fitted within the recess formed by the cutting away of the opposite faces of the two halves A′ A′, said wedge being of substantially the same size as said recess. Longitudinal grooves a^2 a^2 are also formed in the opposing surfaces of the two halves A′ A′, and through the tubular passage formed by said grooves a rod B′ is passed, said rod being joined at one end to the wedge B and extending at its other end somewhat beyond the large end of the mandrel, as shown in Figs. 1 and 2. The outer end of the rod B′ is screw-threaded, and a thumb-nut C is engaged with said screw-threaded end. By the rotation of the thumb-nut C, said nut bearing against the end of the mandrel, the rod B′ will be moved longitudinally within the passage a^2, thereby operating to draw the wedge B toward the end of the mandrel. This movement of the wedge obviously serves to spread the ends a a of the mandrel apart by reason of the engagement of the inclined sides with the inclined sides of the recesses a' a'. A slot a^3 is conveniently formed in the large end of the mandrel, and an arm b, carrying an indicating-finger b', is extended from the rod B′ through said slot to the exterior of the mandrel, as shown in Figs. 1, 2, and 3. A scale b^2 is applied to the surface of the mandrel adjacent to the side of the slot a^3, and, in connection with the indicating-finger b', serves to show the degree of expansion attained at the smaller or expansible end of the mandrel by the longitudinal movement of the wedge B.

It will be observed by reference to the drawings that the bolts A^2 A^3 A^4 are located in the large end only of the mandrel and hold the large ends of the two halves A′ A′ firmly together at all times. The bolt A^4, or the one nearest to the delivery end of the mandrel, is located at a sufficient distance therefrom to permit the ends of the two parts A′ A′ to yield laterally in response to the expansive pressure of the wedge B. Similarly upon the return of the wedge to its initial position by the reverse movement of the nut C the elasticity of the free ends a a of the two halves A′ A′ of the mandrel will cause the said free ends to close together and the delivery end of the mandrel will be again contracted to its original dimensions.

In the form of construction shown in Figs.

6 and 7 I employ instead of the wedge B, engaging the inclined sides of recesses *a'*, a head D, provided with oblique slots *d d*, which engage studs or pins *e e*, set into the adjacent portions of the two parts A' A' of the mandrel. In this form of construction the surfaces of the two halves of the mandrel are cut away sufficiently to form a recess for the reception of the slotted head D, and within which said head moves freely. In this form of construction, as in the form first described, the adjustment of the mandrel is effected by the operation of the thumb-nut C on the threaded outer end of the rod B'.

In the use of the herein-described mandrel, as with the machine illustrated and described in my said prior patent, the tubing is formed in continuous long lengths, and is drawn off from the delivery end of the mandrel by means of rollers or other suitable devices by which the tubing is gripped, the tubing being then cut into suitable lengths to adapt it for use in forming covers or wrappings for bottles. It will also be observed that the mandrel being of a substantially oval shape in cross-section and the vertical diameter at the delivery end being less than at any other point and increasing from said delivery end toward the other end of the mandrel, while the horizontal diameter for a considerable distance from the said delivery end varies but slightly, the expansion of the mandrel, as before described, while it serves to increase the diameter of the tubes formed over it, does not prevent the free removal of the tubing, inasmuch as the slight expansion of the thicker portion at a distance from the delivery end produces an increase in the circumference of the tube sufficient to permit the tube to be freely removed from the thinner end portion, which has been expanded to a proportionately greater degree. The tubes are of course formed in the same manner over my improved adjustable mandrel as in the use of the device illustrated in my said prior patent, the paper or other material being bent up around the larger portion of the mandrel and the edges joined around the small or delivery end only. It will thus be seen that by my improved construction a very simple, cheap, and durable device is provided, and one in which the adjustment of the mandrel for the formation of packing-tubes of various sizes is readily effected.

Having thus described my invention, what I claim is—

1. The herein-described mandrel, comprising two parts or halves formed from elastic material and rigidly secured together at one end of the mandrel, a wedge interposed between the adjacent surfaces of said parts near the other end of the mandrel, and means outside of the mandrel for giving a longitudinal movement to said wedge, substantially as described.

2. The herein-described mandrel, comprising two parts or halves formed from elastic material and rigidly secured together at one end of the mandrel, a wedge interposed between the adjacent surfaces of said parts near the other end of the mandrel, and a rod connected with said wedge and extending longitudinally through the mandrel and provided upon its outer end with an adjusting-nut, whereby a longitudinal movement is given to said wedge to expand the mandrel, substantially as described.

3. An expansible mandrel comprising two parts or halves formed from elastic material and rigidly secured together at one end, a wedge interposed between the adjacent surfaces of said halves, a longitudinal rod connected with said wedge and extending beyond the end of the mandrel, an adjusting-nut having a screw-threaded engagement with the outer end of said rod, an indicating-finger carried by said rod, and a scale applied to the surface of the mandrel to indicate the degree of adjustment of said wedge, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

EDGAR J. STEWART.

Witnesses:
H. G. UNDERWOOD,
WM. KLUG.