Jan. 20, 1925. 1,523,530

H. M. HUPMAN

EXPANDING MACHINE

Filed April 7, 1924

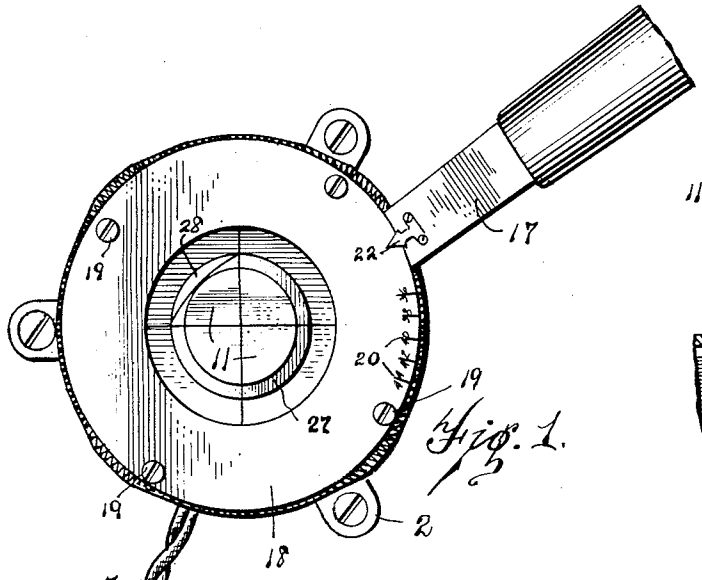


Fig. 1.

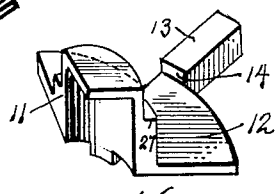


Fig. 6.

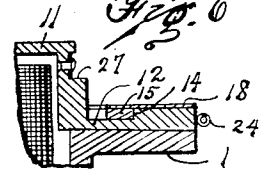


Fig. 5.

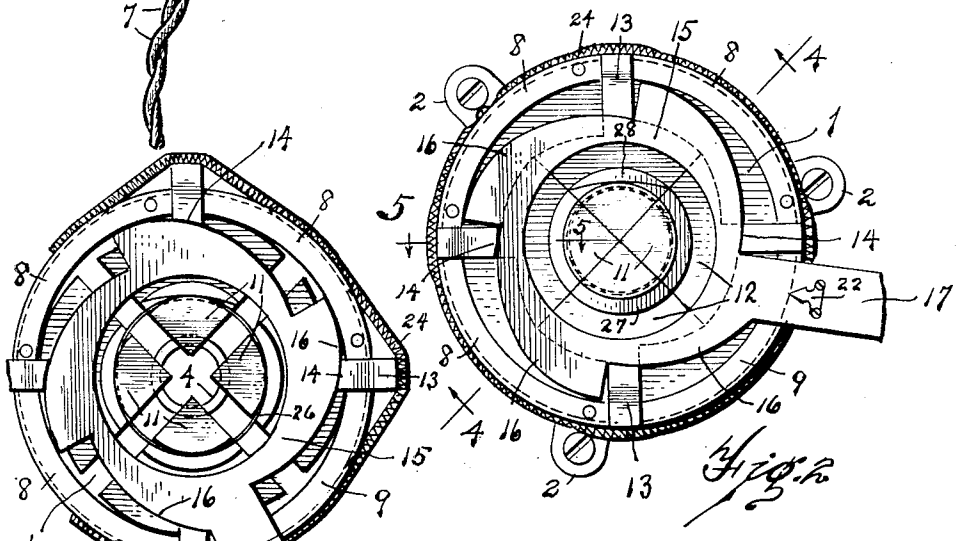


Fig. 2.

Fig. 3.

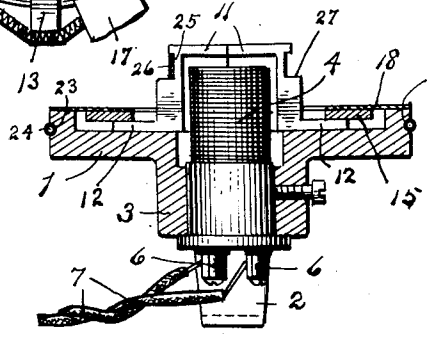


Fig. 4.

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Patented Jan. 20, 1925. 1,523,530

UNITED STATES PATENT OFFICE.

HARPER M. HUPMAN, OF DETROIT, MICHIGAN, ASSIGNOR TO MICHIGAN OPTICAL COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

EXPANDING MACHINE.

Application filed April 7, 1924. Serial No. 704,892.

To all whom it may concern:

Be it known that I, HARPER M. HUPMAN, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Expanding Machine, of which the following is a specification.

This invention relates to means for expanding rings of celluloid and similar materials which become plastic when heated, and its object is to provide a device of this character with a hollow expansible mandrel and with an electric heater within the mandrel.

A further object of this invention is to provide a graduated scale so that the diameter of the expanded mandrel may be readily determined.

This invention consists of the details of construction illustrated in the accompanying drawing and particularly pointed out in the claims.

In the drawing, Fig. 1 is a plan of this improved expanding machine. Fig. 2 is a similar view with the cover removed. Fig. 3 is a similar view with the mandrel in expanded position. Figs. 4 and 5 are sections on the lines 4—4 and 5—5 respectively of Fig. 2. Fig. 6 is a perspective view of a section of the mandrel.

Similar reference characters refer to like parts throughout the several views.

This device embodies a table 1 provided with legs 2 and a central hub 3 in which a heating unit 4 of any desired type is mounted, being provided with binding screws 6 to receive the supply wires 7. The table is formed with segmental flanges 8 and the flange 9 of less height than the others.

A mandrel is formed of the segments 11 connecting to the plates 12 which radially are slidable on the table 1. Guides 13 on these plates are slidable in the radial grooves between the ends of the segmental flanges 8 and 9 and these guides are formed with shoulders 14. An annular cam-plate 15 comprising the cams 16 is rotatable on the plates 12 between the segments 11 of the mandrel and the shoulders 14 on the guides 13. This rotation and the outward movement of the segments of the mandrel is illustrated in Fig. 3. The handle 17 on the cam-plate slides over the segmental flange 9.

A cover plate 18 is secured over the cam-plate 15 and over the guides 13 to the segmental flanges 8 and 9 by means of screws 19. It may be provided with graduations 20 and the handle 17 may be provided with a pointer 22 which extends over the edge of this cover plate 18. A circumferential groove 23 is formed in the cylindrical surface of each flange 8 and 9 to receive a resilient member 24, preferably an endless coil spring which engages the outer ends of the guides 13 and presses them against the edges of the cams 16.

The segments of the mandrel are formed with wide shallow grooves 25, as shown in Fig. 4, and a resilient band 26 having overlapping ends is secured to one of these segments and by its resiliency is held in the bottoms of these grooves. The shoulders 27 below these grooves serve as supports for the rings to be expanded. These shoulders may be cut away at 28 to permit the expanded ring to be grasped by pliers when it is to be removed.

When a ring of plastic material, such as the frame for the lens of eye-glasses and spectacles, is found to be too small, it is placed upon contracted mandrel, resting on the shoulder 27 thereof, and left there until it and the mandrel are properly heated by the heating element 4. This temperature will vary with the different materials, whether pyroxlin or phenol condensation products, and the length of time necessary to properly soften such material will also vary. When the ring is sufficiently soft, the handle 17 is slowly moved until the pointer 22 is brought to the graduation which indicates the desired diameter. The band 26 spans the spaces between the segments of the mandrel and prevents the softened ring being cut by the corners of these segments.

The details of construction and the proportions of the parts may all be changed by those skilled in the art without departing from the spirit of my invention as set forth in the following claims.

I claim:—

1. In an expanding machine, the combination of a support, a hollow mandrel mounted thereon and consisting of a series of segments, a cam rotatable on the axis of the mandrel to expand the mandrel by separating the segments, means to contract the mandrel, and an electric heating unit within the mandrel.

2. In an expanding machine, the combination of a support, a hollow mandrel mounted thereon and consisting of a series of sectors, said mandrel having a circumferential groove, a metal strip secured to the mandrel in said groove and extending around the mandrel, means to expand the mandrel by separating the segments, means to contract the mandrel, and an electric heating unit within the mandrel.

3. In an expanding machine, the combination of a support having radial grooves, a hollow mandrel thereon and consisting of a series of sectors slidable radially on the support and embodying guides mounted in the radial grooves in the support, said mandrel having a circumferential groove, a metal band having overlapping ends mounted in said groove, a rotatable cam-plate embodying a cam for each guide and having a central opening through which the mandrel extends, said cam-plate when rotated adapted to move the mandrel sections outwardly, an endless coil spring extending around the support and engaging the ends of said guides to contract the mandrel, and an electric heating unit within the hollow mandrel.

4. In an expansible device for rings which may be softened by heat, the combination of a hollow expansible mandrel, an electric heating element within the mandrel, and a cam rotatable on the axis of the mandrel to expand the mandrel.

HARPER M. HUPMAN.