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CIRCULAR ARTICLE WORKHOLDER

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Fig. 2

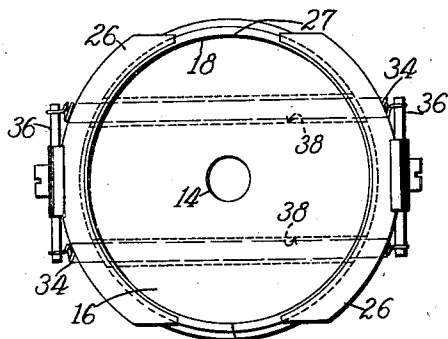


Fig. 1

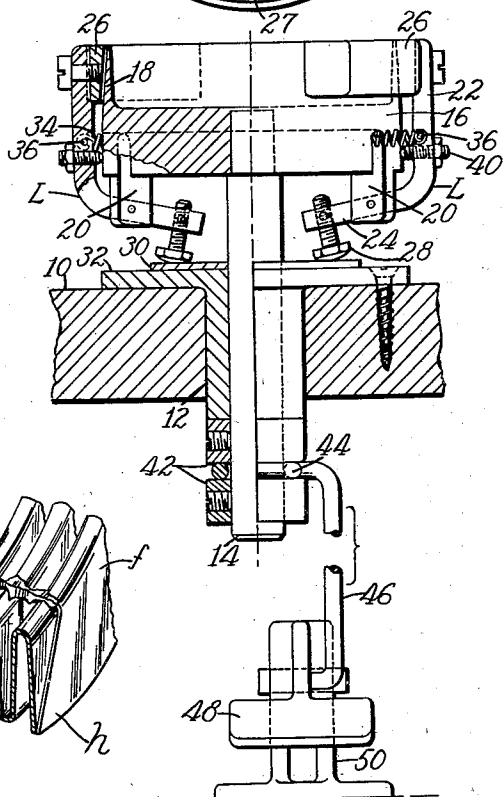


Fig. 4

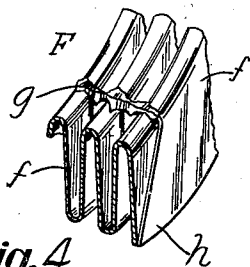
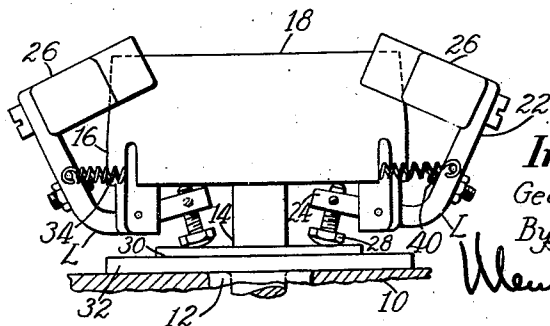


Fig. 3



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CIRCULAR ARTICLE WORKHOLDER

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6 Claims. (Cl. 154-1)

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This invention relates to means by which work-pieces may be supported for the performance of operations upon them, it being especially applicable to the holding of filters, such as are included in gas-masks and the like.

A well known filter for gas-masks is made of frail fibrous material, it being circular in form and molded in successive concentric folds. The molding operation is performed upon halves of the complete filter, the two sections being joined by cementing the ends of the folds at the diameters and pressing the halves together while still in the molds. Thereafter, to ensure proper joints at the ends of the meeting line between the sections, a tab projecting from one side of each joint is cemented to the outer wall of the fold at the opposite side. An object of the invention is to support work of this character securely and without danger of injury, by a relatively simple device, to which it may readily be applied and which will facilitate the operations upon it. To this end, my improved holder has a body provided with an annular portion or flange adapted to receive engagement of the work, as the opposite walls of the outer filter-fold, at its inner and outer sides. Opposite arms pivoted upon the body have extensions co-operating with and conforming to the work-engaging portion. Means, such as a spring, acts upon the arms to draw the extensions yieldably toward the engaging portion to clamp the work in place, and there is means, shown herein as a treadle, for withdrawing the arm-extensions for the application and removal of the work. To settle the work upon the supporting flange into the correct position for joining, or other operation, the movement of the arms is such that their extensions not only travel toward the work-engaging portion, but also along it toward the body. As herein disclosed, the holder-body is mounted upon a longitudinally movable spindle, which, by its movement, causes the withdrawal of the arms, this being accomplished by contact of the arms with the support for the spindle. The spindle is also preferably rotatable in the support, this permitting different portions of the work to be presented to the operator for convenient manipulation.

In the accompanying drawing illustrating a particular embodiment of the invention,

Fig. 1 is a side elevation, partially in vertical

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section, through my improved holder with the arms in work-clamping relation;

Fig. 2, a top plan view thereof;

Fig. 3, a partial side elevation with the arms separated from the work-engaging portion of the holder-body; and

Fig. 4, a perspective view of a fragment of a filter to be operated upon, this being at one of the joints between the sections.

In a supporting table 10, a guide member and bearing 12 is secured. Through a vertical bore in this member a spindle 14 is reciprocable and rotatable. Fixed to the upper extremity of the spindle is the body 16 of the holder, from the periphery of which rises an annular work-engaging flange 18. This flange is of such diameter and so formed that the outer fold of a filter F may be placed over it, the flange fitting loosely within the fold and with the outer wall of the fold resting against its exterior.

Depending from the body 16 at diametrically opposite points are lugs 20, 20, in each of which is fulcrumed a bell-crank-lever L. Each lever has an upwardly extending arm 22 and an arm 24 projecting beneath the body 16. Secured to the upper end of each arm 22 is a lateral extension 26, projecting equally at opposite sides of the lever and having approximately the same height as the flange 18. The extension is arcuate, being concentric with the exterior of the flange, so it may embrace this and exert a substantially uniform pressure toward it. The length of the extensions is such that while they co-operate with the greater portion of the periphery of the flange, at their opposite adjacent ends they are separated by spaces 27, through which access may be had to the work clamped upon the flange. Each arm 24 has a contact member in the form of a screw 28, threaded upwardly through it and with the head resting upon a wear-plate 30 surrounding the spindle upon the flanged upper extremity 32 of the bearing 12 above the table 10. There is exerted upon both the levers L a force tending to draw their arm-extensions toward and into clamping relation with the body-flange 18. This force is herein shown as furnished by two tension-springs 34, 34 attached to the opposite ends of two horizontal rods 36, 36, each projecting equally at opposite sides of one of the lever-arms 22. These springs may pass through passages 38 in

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the holder-body. The approach of the extensions 26 to the flange 18 under the influence of the springs is adjustably limited by screws 40, threaded through the lever-arms 22 with their ends movable into engagement with the periphery of the holder-body.

To shift the arm-extensions 26 away from the flange 18, where they are normally held by the springs in work-clamping relation (Fig. 1), to positions separated from the flange for the application of work to the holder (Fig. 3), the spindle 14 extends below the bearing 12, and has secured to it spaced collars 42, 42. Between the collars and surrounding the spindle lies the looped end 44 of a rod 46, joined to a member for actuation by the operator, as a treadle 48 pivoted upon a bracket 50 upon the floor. Upon depressions of the treadle, its rod draws down the spindle. The holder-body has been held elevated and the treadle raised by the pressure of the screws 28 against the wear-plate 30 under the influence of the springs 34. As the spindle is lowered, it draws down the body, causing the screws to be forced against the wear-plate. The levers L are thereby turned oppositely, so both the arm-extensions 26 are separated from the flange 18. Adjustment of the screws co-ordinates the time of movement of the arms. A filter F or other work-piece may then be applied to the flange, and, upon release of the treadle, the pressure of the screws 28 against the wear-plate will elevate the spindle, the holder-body and the treadle. The elements are now restored to their normal relation, but now the arm-extensions are pressed by the springs against the applied work, the degree of force exerted being limited by the adjustment of the screws 40. As will be evident from consideration of Fig. 3, the work-engaging walls of the extensions 26, in arriving at their clamping positions, move not only inwardly toward the flange 18, but also downwardly along it. In so doing, they both settle the work upon the flange and also urge the end-portions at the spaces 27 toward each other, holding them correctly for the operations to be performed. One side of the work having been operated upon in a position of the holder about its vertical axis convenient for the operator, it may be turned through 180°, the spindle rotating in the treadle-rod-connection 44 without interference and the opposite side brought into operating position.

It will be assumed that the holder is to be employed for the cementing of a filter F, such as is illustrated, in part, in Fig. 4. This filter has opposite sections *f*, *f* molded in concentric folds, which have been joined by cement at the ends of the folds along a diametrical line *g*. At each end of this line, one only of which appears in the drawing, a tab *h* projects circumferentially from the outer wall of the outer fold. The treadle 48 having been depressed, the filter is mounted upon the holder with the outer fold upon the flange 18, and the ends of the meeting line of the sections at the spaces 27 between the clamping extensions 26. Upon release of the treadle, the filter is clamped by the extensions, as above described. The tabs of the respective sections are urged over the outer wall of the other section by the inward and downward pressure created by the springs 34. With one of the spaces 27 before him, the operator may cement the presented tab to the other section to produce a lap-joint. Then, turning the holder to bring the opposite space 27 into position, the operator may similarly join the other tab. The work having

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thus been completed, depression of the treadle frees the filter, which may be removed and another applied to the holder. It will be seen that the filter may be mounted readily upon the device, and securely held in the most advantageous positions for the operations upon it, this without deformation or injury to the delicate filter-material.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a holder for a filter having an annular fold, a body provided with a flange formed to receive the filter-fold, arms pivoted upon the body and having lateral arcuate extensions movable against the outer wall of the filter-fold, a spring acting upon the arms to draw their extensions against said outer wall, means arranged to move the arm-extensions away from the filter, and means arranged to vary the time of initiation of movement of each of the arms independently of the associated arm.

2. A holder comprising a support, a spindle longitudinally movable through the support, a work-receiving body fixed to the spindle, arms pivoted upon and co-operating with opposite sides of the body, said arms having portions contacting with the support, a spring connecting the arms, and means arranged to move the spindle longitudinally to force the arm-portions against the support.

3. A holder comprising a support, a spindle rotatable in and longitudinally movable through the support, a work-receiving body fixed to the spindle, arms pivoted upon and co-operating with opposite sides of the body, said arms having portions revoluble in contact with the support during the rotation of the spindle, a spring connecting the arms, and means arranged to move the spindle longitudinally to force the arm-portions against the support.

4. A holder comprising a support, a spindle rotatable and longitudinally movable in the support, a work-receiving body fixed to the spindle, bell-crank-levers fulcrumed at opposite sides of the body and having work-engaging portions, a spring connecting the levers, and members adjustable upon the levers for respective contact with the body and support.

5. In a holder for a filter having an annular fold in which is a space, the fold having a tab adapted to extend across the space, a body provided with a flange formed to receive the filter-fold with the walls of said fold at the opposite sides of the flange, arms pivoted upon the body and having lateral arcuate extensions movable against the outer wall of the filter-fold to press it against the flange, the ends of the extensions in contact with the filter being separated from each other to expose the tab and the space in the fold, a spring acting upon the arms to draw their extensions against the outer filter-wall, and means arranged to move the arm-extensions away from the filter.

6. In a holder for a filter having an annular fold in opposite sides of which are spaces, the fold having tabs adapted to extend across the spaces, a rotatable filter-receiving body, and opposite arms pivoted upon the body and having arcuate extensions movable inwardly and downwardly and arranged to clamp the filter to the body and to urge each tab across the corresponding space and over the wall of the fold, each end of each extension being separated from the adjacent end of the other extension to expose to the

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operator the spaces in the fold and the associated
tabs upon rotation of the body.

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REFERENCES CITED

The following references are of record in the
file of this patent:

UNITED STATES PATENTS

Number	Name	Date
606,736	Platt	July 5, 1898

Number
1,239,873
1,453,803
1,546,062
1,952,453
1,775,225

6

Name	Date
Bright	Sept. 11, 1917
Milliken	May 1, 1923
Edmunds	July 14, 1925
Mueller	Mar. 27, 1934
Jorgensen	Sept. 9, 1930

FOREIGN PATENTS

Country	Date
Norway	Aug. 3, 1899