June 30, 1942. W. B. WARREN 2,288,218

HOLDER FOR WORK-OBJECTS

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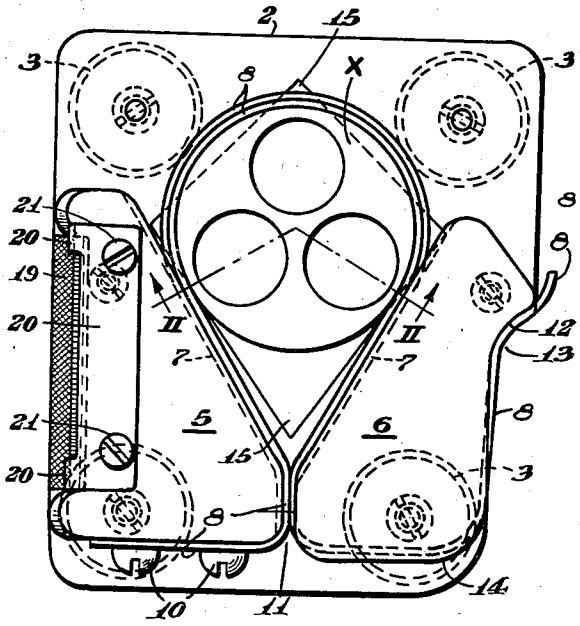


Fig. 1

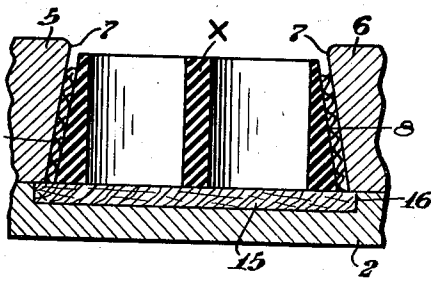


Fig. 2

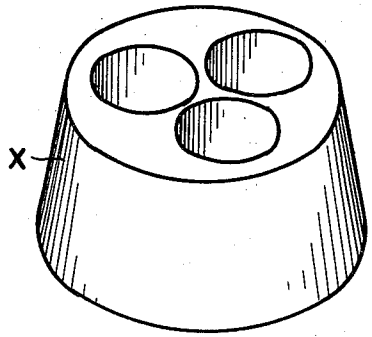


Fig. 6

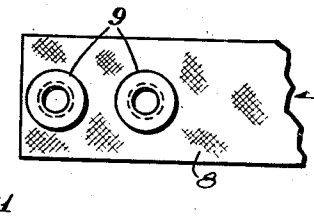


Fig. 5

Fig. 3

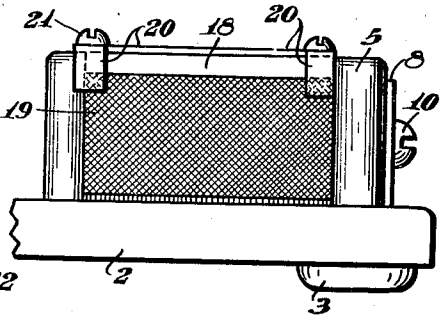


Fig. 4

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HOLDER FOR WORK OBJECTS

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4 Claims. (Cl. 77—63)

This invention relates to holders for work-objects, and more particularly to one which is adaptable for holding resilient stoppers and the like during the boring of holes therethrough, although not limited thereto.

In performing work upon objects of certain classes, it is highly essential that the same be held firmly, but without distortion, while certain other classes of work-objects are of irregular shape. It will be understood that work-objects of these classes do not readily lend themselves to being clamped or held by conventional vises, clamping jaws, etc.

In laboratories it is frequently necessary to use coniform resilient stoppers having extending therethrough holes of various sizes and disposition. Due to the fact that these holes are adapted to snugly grip the instrumentality extending therethrough, they should be as nearly round as possible. Accordingly, the holes must be bored while the resilient stopper is undistorted as otherwise the holes will assume an elliptical shape after the stopper is free from the distorting stresses. Frequently holes are drilled in these coniform resilient stoppers when held in the hand of the operator of a drill press, but this is difficult, as they tend to rotate with the drill.

It is among the objects of the present invention to provide a holder for work-objects of a type which do not readily lend themselves to being held by conventional gripping or clamping devices; such as those work-objects which would not be deformed, those of irregular shape, etc.

Another object is the provision of a holder having the foregoing characteristics which is inexpensively and easily manufactured, and easily and speedily used.

Still another object is to provide a holder having the advantages recited hereinbefore, which is also characterized by embodying in its construction no parts which may be misplaced.

A further object is to provide a device which is specially adaptable for holding resilient stoppers and the like during the boring of holes therethrough, and in such manner that the work-object is undistorted in any direction.

To the accomplishment of these and other desirable objects and purposes, I have designed the present preferred embodiments of the invention presented in the accompanying drawing forming a part of this specification and to which reference should be had in connection with the following detailed description, and in this drawing, for simplicity, like reference numerals have been employed to designate the same parts throughout the several views.

In said drawing:

Figure 1 is a plan of a holder made in accordance with the teachings of the present invention.

Figure 2 is a sectional view on the line II—II of Figure 1.

Figure 3 is an end elevation.

Figure 4 is a fragmentary side elevation.

Figure 5 is a fragmentary elevation of a detail.

Figure 6 is a perspective of a type of object upon which the holder of the present invention may be made to operate.

Referring more particularly to the drawing, the numeral 2 designates a base plate which may, if desired, be disposed to rest upon suitable foreshortened legs 3, the latter in the present instance being shown as composed of a suitable resilient material such as rubber, and remotely disposed with respect to each other.

The base plate 2 carries on its upper surface a pair of spaced substantially triangular or wedge-shaped blocks 5 and 6, which are so disposed that the bases thereof are in approximate parallelism with the adjacent or opposing legs thereof extending divergently. The surfaces of these adjacent or opposing legs, which are designated hereinafter at 7, are planar but outwardly inclined and thus tend to converge at their upper edges. The angularity of the outwardly inclined surfaces 7 of the substantially triangular or wedge-shaped blocks 5 and 6 may be varied as desired, but in the present instance is shown as being approximately 12½ degrees, which is the angle of the frusto-cone of rubber stoppers which are widely used in laboratories. Such a rubber stopper, designated hereafter at X, may, according to its size, occupy a position between the outwardly inclined surfaces 7 of the blocks 5 and 6 wherein it will make a continuous transverse line contact at one point in the length of the adjacent or opposing legs of the substantially triangular or wedge-shaped blocks 5 and 6.

Secured to the base of the block 5 is a flexible strap 8 which is directed through the space 11 between the most adjacent ends of the adjacent or opposing legs of the pair of blocks. Preferably the flexible strap 8 embodies at its secured end a pair of grommets 9 through which screws 10 extend into screw-threaded engagement with the base of the block 5. The flexible strap 8 may be wrapped almost entirely around the work-object X and its free end led back through the space 11. If desired, the free end of the flexible strap 8 may be retained in a clamping instrumentality

of conventional construction (not shown), but preferably the block 6 is provided on its outer leg with a concave transversely extending recess 12 which makes alignment with a similarly formed and disposed recess 13 in the adjacent edge of the base plate 2. These aligned recesses 12 and 13 are adapted to receive the flexible strap 8 and to be held therein by the hand of the operator, whereby the unitary structure of the base plate and the blocks 5 and 6 may be firmly grasped while at the same time holding taut the flexible strap 8. For example, the aligned recesses 12 and 13 may receive either thumb or index finger of either hand of the operator, depending, of course, upon the manner in which the device is disposed and held.

In order to resist any tendency of the free end of the flexible strap 8 to slide upwardly with respect to the base of the block 6, it is provided with an overhanging lip 14 which contacts the upper edge of the flexible strap 8 and prevents its displacement.

Preferably the flexible strap 8 is made of webbing, although rubber and similar flexible materials will suffice.

Referring to Figure 3, the block 5 is provided on its outer leg with a recess 18 within which is disposed a flat file 19, the latter being retained in position by means of a clamping plate 20 which is secured to the block by means of clamping screws 21. It will be perceived that the outer face of the file 19 is so disposed as to occupy an angle other than normal with respect to the top of the block 5; and this is for the purpose of dressing the periphery of the end of a tubular drill which may be used for the boring of the holes in the work-object X.

As stated hereinbefore, the holder of the present invention may be very efficiently grasped in either hand of an operator, which permits the other hand to perform work upon the object being held. In the case of holding resilient stoppers and the like during the boring of holes therethrough, the free hand of the operator may be employed to direct the drill of a drill press for example. As stated previously, it is essential that the holes in such stoppers be bored while the latter are undistorted, as otherwise the holes will assume an elliptical shape after the stopper is freed from the distorting stresses. This, of course, applies to transverse distortion; but it is also essential that such stoppers be undistorted longitudinally, as otherwise the holes will assume a tapered shape after the stopper is free from the longitudinal distorting stresses. Thus, when drilling holes in such resilient stoppers, it is preferable that the same be supported from the side opposite that on which the drill enters, and for this purpose there is provided a pad 15 which lies between the wedges 5 and 6 and in the present instance is shown as comprising a rectangular block of wood occupying a shallow recess 16. Such a pad will, of course, back up the work-object X during the drilling or boring operation, but is so soft as not to damage the advance end of the drill after it has penetrated the said work-object.

In operation: The work-object X is placed upon the pad 15 and embraced by the flexible strap 8, the latter being drawn taut and held in aligned recesses 12 and 13 in the manner described hereinbefore. As shown in Figure 3, the drill may be lowered by the operator into contact with the file 19, whereupon the drill may be rotated in such manner as to cause the periphery of the advance end of the drill to be sharpened in the manner well known in the art. After the drill has been sharpened to the extent desired, it may be elevated and lowered into such position as to contact the top of the work-object X. The drill may then be continuously lowered until the work-object X has been penetrated. Due to the fact that the work-object X is held in such manner as not to be distorted either longitudinally or transversely of its axis, the holes bored by the drill of Figure 3 will be found to be free from taper and ellipticity.

According to the foregoing construction and arrangement of parts, the holder may be easily and speedily used for holding work-objects X which should not be deformed, or which are irregularly shaped, or which for some other reason are of such construction as not to permit of the use of conventional vises, clamping jaws, etc.; and the holder is characterized by having no parts which can become damaged or lost. In addition, the device may easily be made to carry other instrumentalities for utilization in connection with the processing of the work-object X, of which the file 19 is exemplary.

Other modes of applying the principles of the invention may be employed, changes being made as regards the details described, providing the features stated in any of the following claims, or the equivalent of such, be employed.

I claim:

1. A portable holder for work-objects which is adapted in use to be held by a single hand of the operator and suitable for light objects variable in diameter, said holder comprising a base member, a pair of spaced guide elements secured to said base member, said guide elements having opposed surfaces which are convergently disposed, means for supporting a work-object while disposed between said guide elements, a flexible strap adapted to form a loop between the opposed surfaces of said guide elements and to embrace the said work-object, and means for securing one end of said flexible strap against movement, the free end of said flexible strap being adapted for extension between the convergent ends of said elements and having a further extended portion which is adapted to be held against the outer side of one of said guide elements by the same hand of the operator aforesaid.

2. A portable holder for work-objects which is adapted in use to be held by a single hand of the operator and suitable for light objects variable in diameter, said holder comprising a base member, a pair of spaced guide elements secured to said base member, said guide elements having opposed surfaces which are substantially straight and convergently disposed, means for supporting a work-object while disposed between said guide elements, a flexible strap adapted to form a loop between the opposed surfaces of said guide elements and to embrace the said work-object, and means for securing one end of said flexible strap against movement, the free end of said flexible strap being adapted for extension between the convergent ends of said elements and having a further extended portion which is adapted to be held against the outer side of one of said guide elements by the same hand of the operator aforesaid.

3. A portable holder for work-objects which is adapted in use to be held by a single hand of the operator and suitable for light objects variable in diameter, said holder comprising a base member, a pair of spaced guide elements secured

to said base member, said guide elements having opposed surfaces which are substantially flat and convergently disposed, means for supporting a work-object while disposed between said guide elements, a flexible strap adapted to form a loop between the opposed surfaces of said guide elements and to embrace the said work-object, and means for securing one end of said flexible strap against movement, the free end of said flexible strap being adapted for extension between the convergent ends of said elements and having a further extended portion which is adapted to be held against the outer side of one of said guide elements by the same hand of the operator aforesaid.

4. A portable holder for work-objects which is adapted in use to be held by a single hand of the operator and suitable for light objects variable in diameter, said holder comprising a base member, a pair of spaced convergent guide elements secured to said base member, said guide elements having opposed surfaces which are substantially flat and outwardly inclined, means for supporting a work-object while disposed between said guide elements, a flexible strap adapted to form a loop between the opposed surfaces of said guide elements and to embrace the said work-object, and means for securing one end of said flexible strap against movement, the free end of said flexible strap being adapted for extension between the convergent ends of said elements and having a further extended portion which is adapted to be held against the outer side of one of said guide elements by the same hand of the operator aforesaid.

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