

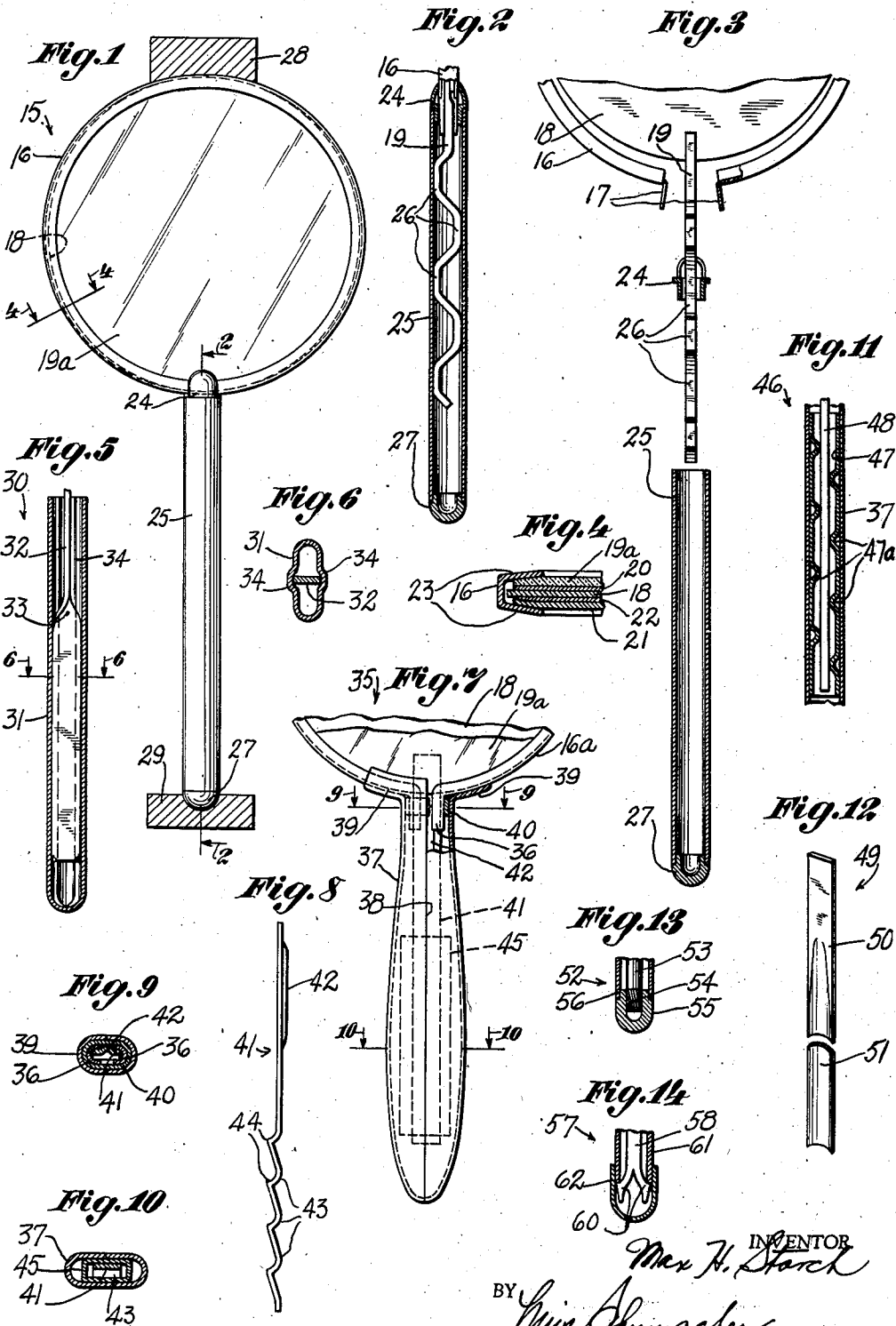
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FRAME ASSEMBLY

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FRAME ASSEMBLY

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This invention relates to devices such as hand mirrors.

One object of the invention is to provide an improved device of the character described wherein a split frame for encircling and holding an article such as a mirror is permanently locked in the article holding relation by a handle, as set forth in my Patent No. 2,049,029, issued July 28, 1936, for Frame assemblies for mirrors and the like.

In the patent referred to, a screw means is utilized to tension the handle against the frame, with the aid of a plate fitted in the latter and a rod extending from the plate through the handle. While the device of this patent represented a great improvement over previous practise in cheapening the cost of manufacture and assembling, nevertheless I found that it possessed certain characteristics which, from the standpoint of the present invention, can be considered as drawbacks. For instance, the extent to which the screw means was tensioned frequently varied so that sometimes the same was too loose, and hence the desired rigidity of the handle was not realized; if too tight, an unnecessary strain was placed upon the parts, which might result in breakage in use. Then again, certain desirable features of design of the handle could not be produced in a cheap and practical manner, as will be hereinafter pointed out in detail. Also the handle was not sufficiently braced by the rod, because of the spaced relation of these parts except at the ends of the handle. Since a hand mirror is a quantity production item, these drawbacks are very significant in view of the present invention.

The present invention aims first of all to provide a novel means of assembling which shall require merely that the handle shall be forcibly applied or fitted to the rod to be operatively secured thereto.

While such a frictional sliding or press fit assembly may be provided in various ways, it is preferred to practise the same in such a manner that other factors may not arise and create labor operations to thus detract from the value of the invention. For example, the handle and rod may each vary slightly in length and particularly in thickness or diameter; also there might be burrs or irregularities accidentally created on the rod or handle, as in sawing handles from a standard length of tubing. These things may create uncertainties and difficulties in an ordinary press fit assembly. In quantity production, true press fit may be slow and difficult, especially if it be desired to have an ample length of interengage-

ment between the rod and handle. Further, the somewhat fragile or thin character of the parts must be borne in mind as preventing the application of a very high longitudinal pressure in assembling.

Hence the invention preferably contemplates, as a further improvement, the provision of improved means providing a yielding or resilient press fit, or a frictional or other fit between the handle and the rod elements one of which is coincidentally subjected to a deformation, whereby the use of parts such as screws or other separately manipulated members is avoided, and the nature of the engagement or fit being self-sufficient to hold the handle on the rod and to lock the frame securely in article holding position.

Therefore, the invention is well adapted for quantity production, irrespective of accidental irregularities and variations, and produces an ideal arrangement and method in which the human element is reduced to a minimum.

Heretofore, in the case of certain handles of a tapered form, it has been customary to attach these handles to an internal rod by fusing in the handle a binding material which melts at about the boiling point of water. This method consumed a lot of time and was rather messy, and the present invention aims to permit such handles to be readily mechanically attached according to the general principles herein stated.

The invention also permits utilization of the radial resilience of a split channel frame to assure absolute tightness of the bearing relation between the frame and the adjacent end of the handle.

It will be understood that the reference to Patent No. 2,049,029, is made herein by way of clarifying the purpose of the invention, rather than to limit the invention to the type of frame or article holding means therein disclosed, since the invention may be advantageously employed with continuously closed frames, or with split frames that are independently locked or soldered at the split, and have rods projecting radially from the frame, plate or back thereof.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated in the annexed drawing, wherein like parts are designated by the

same reference characters throughout the several views.

In the drawing:

Figure 1 is a plan view showing a device embodying the invention, and a method of assembling the same.

Fig. 2 is a fragmentary sectional view of the handle assembly.

Fig. 3 is a fragmentary view showing the parts thereof separated and in relation for assembling, with a portion of the frame in section.

Fig. 4 is a fragmentary enlarged sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a sectional view of a modified handle assembly.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary view with parts in section showing a modified device embodying the invention.

Fig. 8 is an edge of the rod thereof.

Figs. 9 and 10 are sectional views taken on the lines 9—9 and 10—10 of Fig. 7.

Fig. 11 is a fragmentary view of a modified handle assembly embodying the invention.

Fig. 12 is a fragmentary view of a modified rod for a handle.

Figs 13 and 14 are fragmentary sectional views of modified handle assemblies.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Referring in detail to the drawing, 15 denotes a device such as a hand mirror embodying the invention. The same may include a split channel frame 16, having outwardly extending end portions 17. Within this frame is secured an anchorage such as a plate 18 fitted therein and having a rod 19 extending radially outward between the end portions 17. An article such as a mirror 19a, backing sheet 20, a back plate 21, and an intermediate sheet 22 of paper or the like may also be fitted in the frame 16, whose flanges 23 diverge toward their edges to thus snugly wedgingly secure the parts, as shown in Fig. 4.

Sleeved over the rod 19 and the tongues 17 is a ring or washer 24 which locks the frame closed and which may be a finishing element to conceal the joint.

Also sleeved upon the rod 19 is a handle 25, which is in the form of a tube with the internal surface of which the corrugations 26 of the rod are wedgingly press fittingly engaged.

The handle 25 may be closed at its lower end by an integral or press fit cap portion 27. The ring 24 may also be an integral part of the handle but is preferably separate to preliminarily secure the end portions 17 and leave the operator free to conveniently apply the handle 25.

In assembling, the ring 24 is first engaged over the tongues 17, and then the handle 25 is forcibly applied. The pressure may be applied by means of a shoe 28 against which the top of the frame seats, and a head 29 which seats the cap 27. The cap 27 may then be secured to the handle or it may have been initially secured thereto,

The rod 19 is substantially less in thickness than the internal diameter of the handle 25, but it possesses ample stiffness and rigidity, and is slidably pressed into the handle. The corrugations 26 are larger in transverse dimension than the said internal diameter, but the rod suffers a deformation and tends to powerfully expand to grip the handle at a plurality of successively spaced points. The handle is thus rigidly held, by reason of the engagement at successive points therealong, and presses tightly against the lock ring 24. No screw or other positive means is needed, and the handle cannot be removed, except with the exercise of a very strong pull thereon, much greater than what the device will be subjected to even if abused. The construction also permits the cap 27 to be press fitted inside of the handle so as to provide a smooth outside conformation, a result not readily obtainable with the device of Patent No. 2,049,029.

The resilience of the frame 16 may aid in the assembling. For instance, the divergent flanges 23 permit of a slight resilient spread; also the frame 16 generally permits some resilient deformation into a somewhat oval shape when pressure is applied between the assembling heads 28, 29. The metal plate 18 of course limits the deformation, producing a novel coordination. While the invention is operative irrespective of this resilient action, the latter provides an automatic take up for possible slight variations while assuring a relatively uniform tightness in the bearing pressure of the upper end of the handle against the adjacent portion of the frame 16 or ring 24 as the case may be.

In Figs. 5 and 6 is shown a modification of the invention including a device 30 of which only the handle structure is shown, comprising a handle 31 of irregular or oval form in cross section, and a rod 32 which extends flatwise from the plate 18 and is twisted at 33 so that its width is at right angles to the longer axis of the oval. The device 30 illustrates the novel principle of a handle that is slightly resiliently deformable or spreadable by the rod when the handle is press fitted thereon. The rod 32 need not therefore have the corrugations 26. The ornamental ridges or longitudinal channels 34 may serve as guides for the rod.

In Figs. 7 to 10 is shown a device 35 according to another modification of the invention. In this case, the end portions 36 of the frame 16a may be of channel form for greater strength. The handle 37 is of tapered oval or other ornamental shape, and hence is stamped in longitudinal halves which are soldered together along the edges of the handle or along the line 38 to form a tube that is directly closed at its lower end and at its upper end includes a decorative socket 39 which in this sense replaces the ring 24. To facilitate assembling, a plain concealed ring 40 may be slipped over the tongues 36 to hold the frame 16a assembled. The rod 41 which extends from the plate 18 may have a central longitudinal rib 42 pressed therein for reinforcement at the joint of the frame and the handle, and may have corrugations 43, parts of which may be arranged to form wedges that are slightly upwardly pointed at 44 so that it is much more difficult to remove the handle than to apply the same. For gripping these wedge portions, the handle may have an internal tube 45 of uniform cross section soldered to one half of the handle before the handle is assembled along the line 38 as above described. The device 35 may

be assembled as above described. Thus a simple mechanical means displaces the use of pitch and other fusible substances heretofore used for anchoring a handle of this type to a rod.

Fig. 11 shows a device 46 which illustrates further the principle that either the rod or the handle may be subject to elastic deformation for the press fit assembly. Thus any handle portion or tube such as 47 may be used in place of the tube 45, with a plain straight rod 48, the tube having transverse corrugations 47a for yieldingly frictionally engaging the rod 48 in a powerful manner when assembled as hereinbefore described. The tube 47 may be soldered to the handle 37 at only a few spaced points to permit the walls of the tube to be slightly resilient, due to a slight clearance between 37 and 47.

In Fig. 12 is shown a device 49 comprising a rod 50 which illustrates that a longitudinal curve or corrugation 51 may be used instead of the transverse corrugations. This rod is flat at one end for connection to the plate 18 and is otherwise curved in cross section throughout to thus provide a reenforced shape which can slightly flatten resiliently when assembled with a handle.

Fig. 13 shows a device 52 having a rod 53 whose lower end has inclined circularly arranged ridges 54 in the manner of a press screw, and which is pressed into the cap 55 that is secured to the handle 56. The cap 55 is adapted to be cut by the ridges 54 so as to afford a powerful connection.

Fig. 14 shows a device 57 having a rod 58 split at its lower end to provide a resiliently expandible portion comprising tongues 60 adapted for hooklike engagement with the lower edge of the handle 61. The separation may be increased by a spinning tool to cause a more powerful engagement of the tongues or to afford a take up if the handle 61 be slightly too short. Then the cap 62 may be press fitted on the handle.

It will be noted that various modifications disclosed may be interchangeably used and combined. The handle of Fig. 5 may be used in the devices 15 and 35; the rod 50 may be used in place of the rods 19, 41, and 32 and these rods may all be interchanged; the handles of Figs. 2, 5, 7, 11, 13, and 14 are all interchangeable with the frame devices shown in Figs. 3 and 7.

It will be noted that the rod and handle elements are in all cases directly connected by a lineal axial movement, and without requiring any rotary or angular movement: the lower cap may in this sense be regarded as an integral part of the handle element in all cases, and the inner tube in the tapered handle may be regarded as an integral part of the handle, since the halves thereof may be readily cast to produce the desired uniform internal contour or the internal corrugations as herein disclosed. The transverse and longitudinal corrugations, teeth, and tongues may in all cases be regarded as projections or irregularities which interengage the handle and rod elements in response to the axial lineal relative movement. In all of the modifications disclosed it may be possible to pull off the handles by exerting sufficient force, but the holding power is ample by a sufficient margin for safe and practical use of the devices.

By the term resilient press fitted is meant the actions which result in elastic deformation of an element upon the relative axial movement. The term elastic frictional engagement is pertinent in the same sense. Since in all cases the movement is axial, the deformation may in all

cases be defined as longitudinal. The holding action may also be defined as longitudinally yielding, and more broadly, as yielding, since at least one of the elements in all cases is deformed in response to the relative axial movement between the rod and handle elements.

It will thus be seen that I have provided a device which fulfills the objects of the invention and is well adapted for practical use.

I claim:

1. A device including a resilient frame adapted to extend around an article, said frame being split and having outward extending end portions, a plate in the frame having a rod element extending outward between said end portions, said frame being resiliently deformable against an edge of the plate, a handle element sleeved on the rod element and said end portions, said handle and rod elements having means axially directly interconnecting the elements, said means comprising a slightly resilient metallic portion to permit a direct frictional connection between said elements irrespective of variations in thickness of the rod element and the internal diameter of the handle element to thus maintain the elements permanently interengaged in normal use thereof, said means being responsive to the forcible sleeving of the handle over the rod, one end of the handle element bearing against the frame, and the frame being resiliently deformed between said edge of the plate and the handle element upon sleeving the latter on the rod so as to constantly oppose the resilient means to maintain a snug contact with the handle element as against any yielding of the resilient means.

2. A device including a resilient frame adapted to extend around an article, said frame being split and having outward extending end portions, a plate in the frame having a rod element extending outward between said end portions, said frame being resiliently deformable against an edge of the plate, a handle element sleeved on the rod element and said end portions, one of said elements having a corrugation to provide resilient portions deformable in response to sleeving of the handle element over the rod element for frictionally permanently interconnecting the elements, one end of the handle element bearing against the frame, and the frame being resiliently deformed between said edge of the plate and the said end of the handle element upon assembling the latter with the rod element, so that the resilience of the frame opposes that of the corrugation to maintain snug contact between the said end of the handle element and the frame.

3. A device including a resilient frame adapted to extend around an article, said frame being split and having outward extending end portions, a plate in the frame having a rod element extending outward between said end portions, said frame having a portion resiliently deformable against an edge of the plate, a handle element sleeved on the rod element and said end portions, said handle element having one end bearing against said resiliently deformable portion of the frame, one of the elements having resilient corrugations, the latter providing points arranged at an acute angle to the elements so as to tend to bite into the companion element to frictionally engage and prevent removal of the handle element and to permit relatively easy sleeving of the handle element over the rod element, the said frame portion being resiliently

deformed by the handle element between said edge of the plate and the said end of the handle element upon assembling the latter with the rod element to thus assure snug contact between the frame and said end of the handle element.

4. A device including a frame adapted to extend around an article, said frame being split and having integral outward extending end portions, the latter and the frame being of continuous channel form, a plate in the frame having a rod element extending outward between said end portions, a tubular handle sleeved over the rod and said end portions, said rod having substantially less thickness than the internal diameter of the handle so as to be light in weight, said rod being resilient and having a corrugated portion of somewhat larger size than the internal diameter of the handle for frictionally gripping the latter to thus permanently retain the handle in assembled position, and said handle being sleeved over the channel shaped end portions of the frame and being engaged with said end portions so as to reenforce the handle against lateral movement due to the resilience of the rod, said end portions terminating in advance of the corrugated portion.

5. A device including a frame adapted to extend around an article, said frame being split and having integral outward extending end portions, the latter and the frame being of continuous channel form, a plate in the frame having a rod element extending outward between said end portions, a tubular handle sleeved over

the rod and said end portions, said rod having substantially less thickness than the internal diameter of the handle so as to be light in weight, said rod being resilient and having a corrugated portion of somewhat larger size than the internal diameter of the handle for frictionally gripping the latter to thus permanently retain the handle in assembled position, and said handle being sleeved over the channel shaped end portions of the frame and being engaged with said end portions so as to reenforce the handle against lateral movement due to the resilience of the rod, said end portions terminating in advance of the corrugated portion, said corrugated portion including a series of corrugations, said series extending along the rod.

6. A device including a frame adapted to extend around an article, said frame being split and having outward extending end portions, a plate in the frame having a rod element extending outward between the end portions, a tapered handle sleeved over the rod and the end portions, said handle having at its upper end a socket to snugly receive an adjacent portion of the frame, and a tubular element of uniform size fixed in the handle and sleeved over the rod element, one of said elements having a transversely corrugated portion to cause the elements to frictionally grip each other for permanently securing the handle on the rod element.

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