

Aug. 8, 1961

H. GERBER

2,994,949

APPARATUS FOR ASSEMBLING AND DISASSEMBLING WATCH CRYSTALS

Filed Aug. 4, 1959

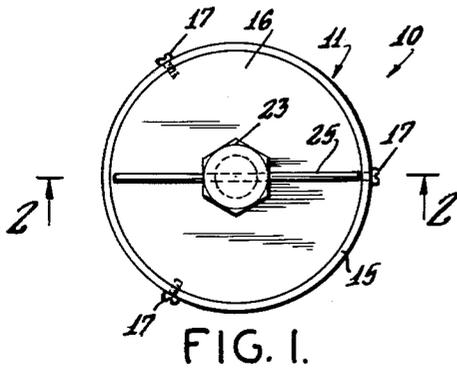


FIG. 1.

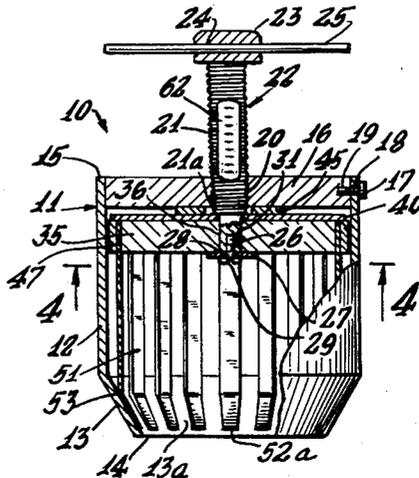


FIG. 2.

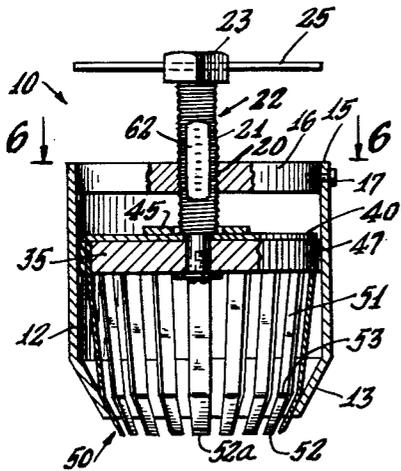


FIG. 3.

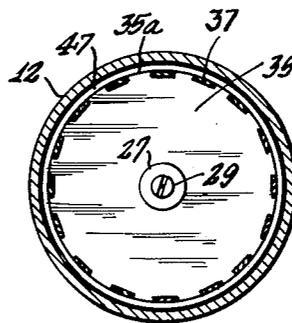


FIG. 4.

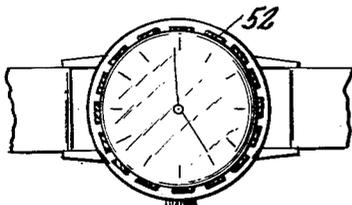


FIG. 5.

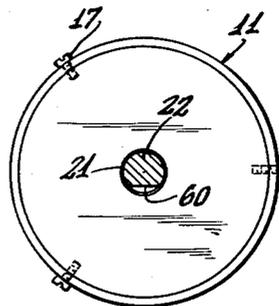


FIG. 6.

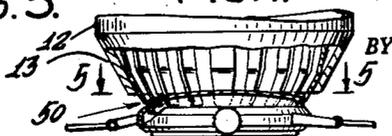


FIG. 7.

INVENTOR.

HERMAN GERBER

BY *J. B. Felsch*
ATTORNEY.

1

2,994,949
APPARATUS FOR ASSEMBLING AND DISASSEMBLING WATCH CRYSTALS

Herman Gerber, 406 E. 149th St., Bronx, N.Y.

Filed Aug. 4, 1959, Ser. No. 831,632

8 Claims. (Cl. 29—210)

This invention relates to chucks for watch crystals.

Difficulty has been experienced in removing watch crystals from watches and in replacing crystals in the watches. This is particularly so because watch crystals come in various sizes. It is therefore an object of my invention to provide a highly improved, easily operable watch crystal chuck which may be held in the hand and which is provided with a screw having a handle, the arrangement being such that upon turning the handle, the screw turns to move a plurality of annularly arranged spring fingers radially inwardly, or in a converging action to grip the edge of the watch crystal, to facilitate removal of the watch crystal from the watch, and to permit the watch crystal to be easily placed back in proper place on the watch, so that the handle may be turned backward to release the crystal after it has been properly positioned in the watch.

Another object of this invention is to provide in a chuck of the character described, a scale which will show sizes of crystals gripped, so that when the crystal is gripped the scale will indicate the size of the gripped crystal.

A further object of this invention is to provide a chuck for watch crystals, of the character described, in the form of an expanding and reducing tool which will remove round plastic watch crystals and then insert new round plastic crystals in the watch. The device embodying the invention comprises a casing having a tapered annular wall formed with a round mouth. Within the casing are a plurality of strip springs, means being provided to advance the springs so that the ends of the springs are guided inwardly to converge whereby to permit gripping various sized crystals.

A still further object of this invention is to provide a strong, rugged, and durable tool of the character described which will be relatively inexpensive to manufacture, which shall be easy to manipulate, positive in operation and practical and efficient to a high degree.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified on the construction hereinafter described, and of which the scope of invention will be indicated in the following claims.

In the accompanying drawing in which is shown at least one illustrative embodiment of the invention,

FIG. 1 is a top plan view of a chuck for watch crystals embodying the invention;

FIG. 2 is a cross-sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 2, but showing the tool in a more contracted position;

FIG. 4 is a cross-sectional view taken on line 4—4 of FIG. 2;

FIG. 5 is a cross-sectional view of the ends of the spring fingers gripping a watch crystal, and taken on line 5—5 of FIG. 7;

FIG. 6 is a cross-sectional view taken on line 6—6 of FIG. 3; and

FIG. 7 is a partial side view of the tool gripping a watch crystal with parts broken away and in cross-section.

Referring now in detail to the drawings, 10 designates a watch crystal chuck embodying the invention. The chuck 10 comprises the casing 11 which may be made of metal or of other suitable material if desired. Said casing 11 comprises a cylindrical portion 12 from which extends

2

a lower or forward frusto-conical portion 13. At the forward end of portion 13 is an annular rim edge or mouth 14. At the upper end of the cylindrical wall is a rim edge 15. Fitted within the upper end of the cylindrical wall 12 is an annular wall 16 which may be fixed to the casing wall 12 means of a plurality of radial screws 17. Screws 17 pass through holes 18 in wall 12 and engage in threaded openings 19 in the annular edge of the wall 16. Wall 16 is formed with a central internally screw threaded opening 20. Screwed within said opening 20 is a threaded shank 21 of an operating member 22. Member 22 has a head 23 at its upper end formed with a through opening 24 through which passes an elongated cross handle 25 fixed to the head. Extending downwardly from the shank 21 is a stem 26 of reduced diameter. Contacting the lower end of the stem 26 is a small annular collar 27 having a diameter greater than the outer diameter of the stem 26. The collar 27 has a central opening 28 and extending through said opening is a screw 29 having a shank screwed within an axial threaded opening 31 in the stem. Mounted on the stem 26 is a disc 35 formed with a central opening 36 through which the stem passes. The stem may rotate in said opening 36. The collar 27 contacts the under side of the disc 35. Said disc 35 is formed at its periphery with a plurality of equiangularly spaced, longitudinal, shallow grooves 37. Mounted on top of the disc 35 is a thin plate 40 covering the upper ends of the grooves 37 and extending somewhat beyond the annular edge 35a of the disc 35. Plate 40 contacts the shoulder 21a formed at the lower end of the shank 21. Interposed between plate 40 and wall 16 is a spacer washer 45 having a central opening through which the shank 21 loosely passes.

Surrounding disc 35 is an annular ring or sleeve 47 frictionally gripping the periphery edges 35a of the disc 35 between the grooves 37. Mounted on disc 35 and fixed thereto by the ring 47, are a plurality of similar, symmetrically disposed, spring strips 50. Each spring 50 comprises a straight portion 51 of uniform width, the upper end of which is received within one of the grooves 37. The upper edge of each spring 50 contacts the underside of the plate 40. Extending from the lower end of straight portion 51 of each spring 50 is an inwardly bent spring finger 52 disposed at an angle to the straight portion 51, and forming a knee 53 therewith.

When the screw 22 is fully retracted the straight portions 51 of the springs are parallel to the axis of the casing 11, and spring fingers 52 contact the inner frusto-conical surface 13a of the frusto-conical wall 13 of the casing, as illustrated in FIG. 2 of the drawing.

However, upon turning the handle 25 clockwise, disc 35 and plate 40 and ring 47 and the springs 50 which form a unit, move downwardly to flex the springs upwardly. It will be noted that the spring fingers 52 in the position of FIG. 2, normally press outwardly against the surface 13a. As the springs are all pushed downwardly, the spring fingers 52 are advanced and slide along the surface 13a so that the end edges 52a of the spring fingers converge and lie on a circle of ever decreasing diameter. The handle is turned until the spring fingers grip the edge of the crystal. Obviously, the smaller the crystal, the more the handle 25 must be turned for the crystal to be gripped. When the crystal is firmly gripped and contacted, the tool may be moved away from the watch to carry the plastic watch crystal with it. When the plastic watch crystal is pressed radially at its edge, it decreases its diameter sufficiently to be removable from the bezel of the watch. In the same manner, a new round plastic crystal may be gripped with this tool and contacted, and then placed in position on the watch, at which time the tool is turned for loosening

ing the grip, and the crystal expands so as to be gripped by the bezel of the watch.

Means is provided to indicate the size of the crystal gripped by the spring fingers. To this end the shank 21 of the screw 22 is formed with a flat surface 62. Said flat surface may be provided with a marked or engraved scale. The scale is read against the upper surface of the wall 16.

It will now be understood that there is provided an expanding and contracting tool which will constrict round plastic watch crystals and insert new round plastic crystals into a watch, and this may be done by placing the tool over the plastic crystal and by turning the handle clockwise the crystal is compressed in diameter so that it can be removed.

The calibration on a scale indicates the size of crystal removed so as to make it possible to select proper size crystals for replacement.

It will thus be seen that there is provided an apparatus in which the several objects of this invention are achieved and which is well adapted to meet the condition of practical use.

As possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A watch crystal chuck comprising a casing having a cylindrical wall and a frusto-conical wall extending from one end of the cylindrical wall, a closure wall fixed to the other end of the cylindrical wall, and formed with an axial screw threaded opening, an axial screw threaded through said opening, said screw formed with a reduced stem at the end thereof within the casing defining a shoulder, a disc rotatably received on said stem, means fixed to the stem and contacting the underside of said disc, a plate on the upper side of said disc, said stem passing through an opening in said plate, and said plate contacting said shoulder, a plurality of strip springs having portions at the inside of said casing and contacting the outside of said disc, and end edges of said springs contacting said plate, means surrounding said disc and the portions of the springs which contact said disc, said springs having inwardly bent fingers at their lower ends contacting the inner surface of said frusto-conical wall of said casing, the tips of said fingers being arranged in a circle, whereby when the screw is turned in one direction the springs will move longitudinally of the casing to cause said fingers to converge about the watch crystal to be held.

2. A chuck comprising a hollow casing having a converging annular mouth at one end, a member movable longitudinally within said casing, and at least four spaced longitudinal strip springs arranged in a circle around the inside of the casing and having converging spring fingers

at the ends thereof contacting the converging mouth of the casing, and means movable with said member to retain said fingers against the converging mouth and to move said springs forwardly and longitudinally of the casing in the direction of the annular mouth, to cause said fingers to converge, the tips of said fingers being arranged in a circle which decreases in diameter as said springs are moved forwardly.

3. The combination of claim 2 in combination with means screw threaded relative to the casing to move said member.

4. A chuck comprising, a casing having a cylindrical wall, a rear wall and a converging open annular front mouth, an axial screw screwed to the rear wall, a handle at the rear end of the screw, a member within the casing, means to rotatably and non-slidably connect the forward end of the screw to said member, at least four longitudinal strip springs arranged in a circle around the inside of the cylindrical wall, means on said member to move said springs forwardly in a direction away from said rear wall, said springs having inwardly bent spring fingers at their forward ends contacting the inside of the converging mouth of the casing, the tips of said fingers being arranged in a circle, whereby the tips of said fingers will converge when the springs are moved forwardly.

5. The combination of claim 4, and a scale on said screw to indicate sizes of watch crystals gripped by said spring fingers.

6. The combination of claim 1, in combination with a spacer washer on said screw and between the plate and rear wall.

7. In combination, a cylindrical casing, at least four strip springs arranged in a circle around the inside of the casing, means to press said springs against the inside of the casing, means to move said springs longitudinally of the casing, and said casing having means at its forward end to move the forward tips of said springs radially inwardly as said springs are moved longitudinally forwardly the tips of said springs projecting beyond the casing and being arranged in a circle which becomes smaller as said springs are moved in a direction to extend the tips further out of the casing.

8. The combination of claim 7, the forward ends of said springs being inclined forwardly and inwardly.

References Cited in the file of this patent

UNITED STATES PATENTS

965,054	Weekes	July 19, 1910
1,213,133	Poister	Jan. 16, 1917
1,411,082	Gotsdanker	Mar. 28, 1922
2,338,343	Maire	Jan. 4, 1944
2,357,904	Mulcrone	Sept. 12, 1944
2,468,286	Behlert	Apr. 26, 1949
2,828,663	Andrade	Apr. 1, 1958