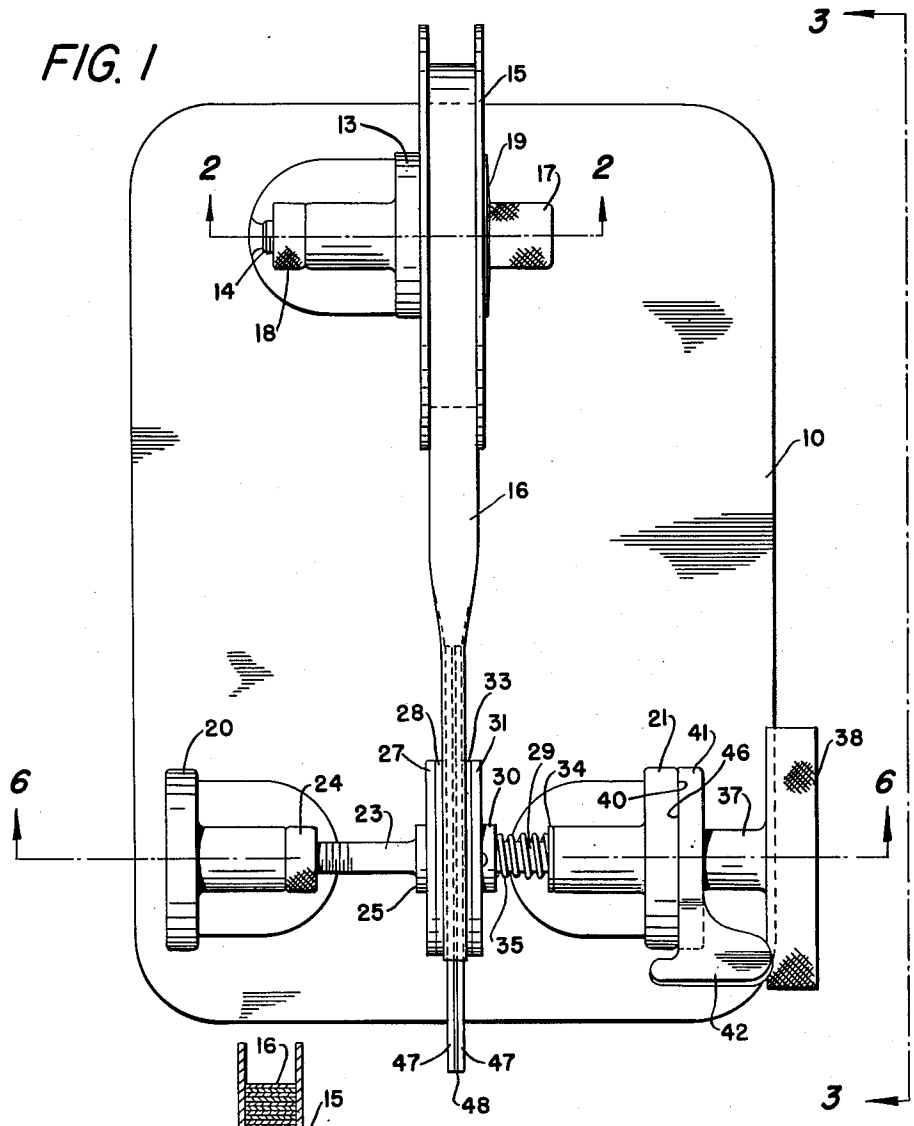
Jan. 13, 1953 L. E. CHAMBERLAIN 2,625,197

SLIDE BINDER CLAMPING APPARATUS

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FIG. 1



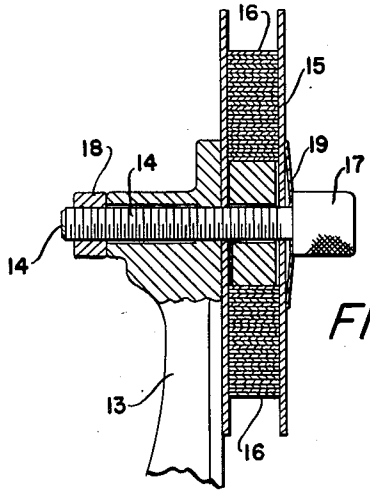


FIG. 2

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SLIDE BINDER CLAMPING APPARATUS

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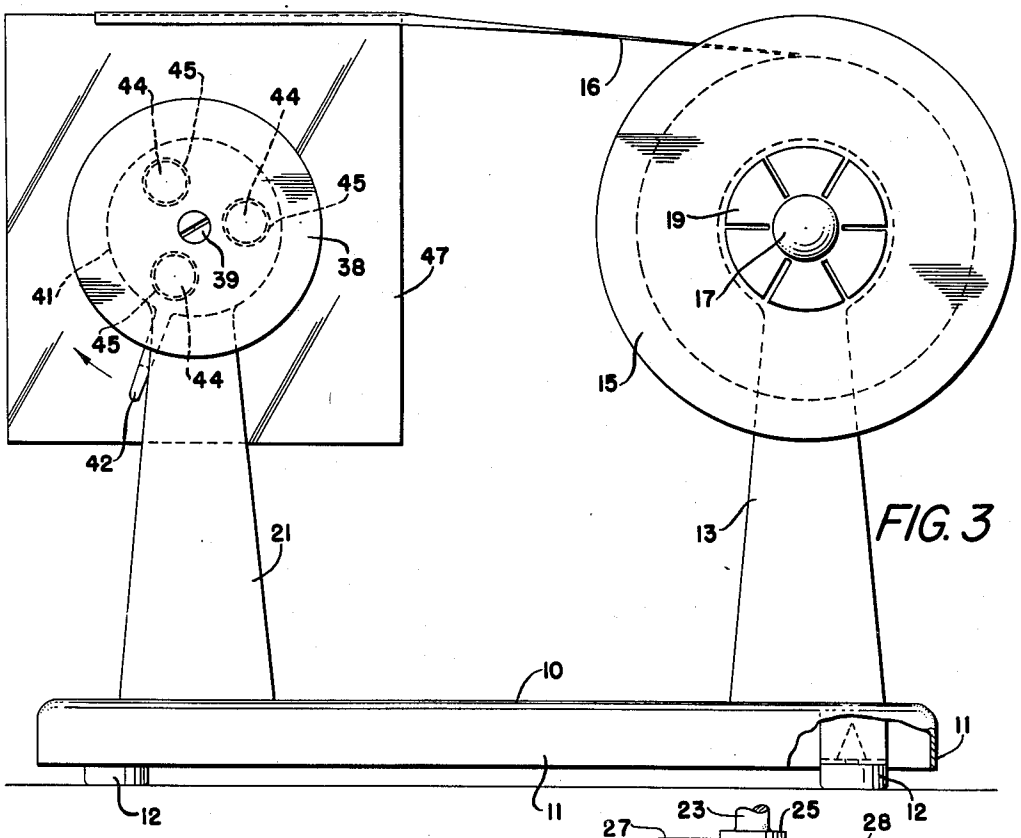


FIG. 3

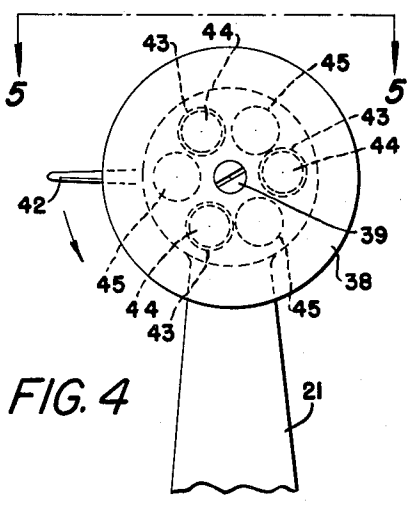


FIG. 4

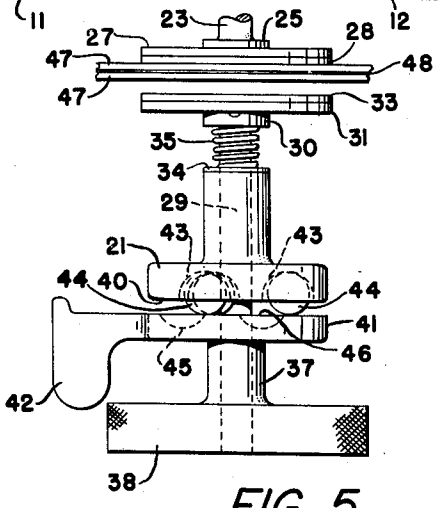


FIG. 5

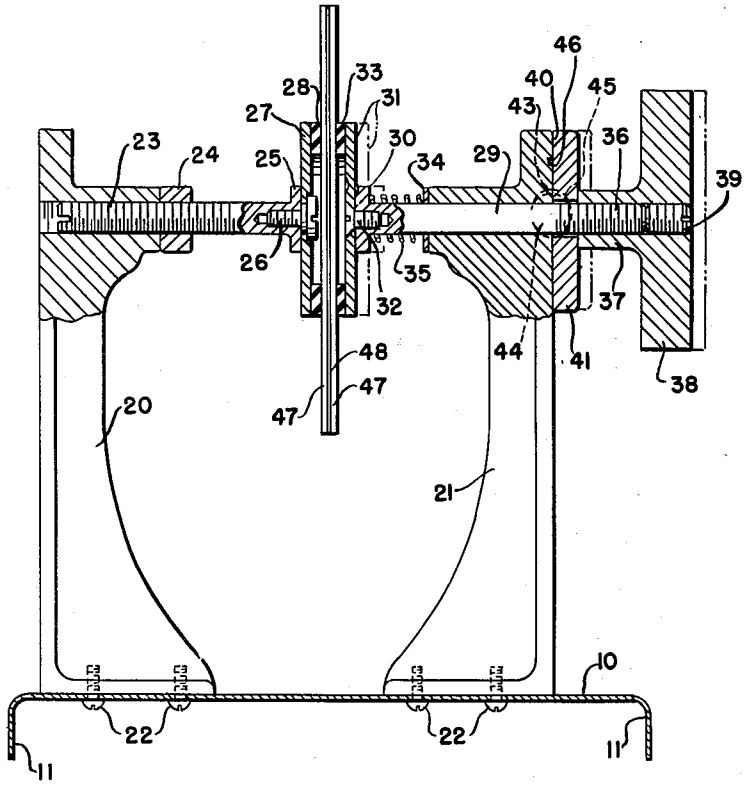
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SLIDE BINDER CLAMPING APPARATUS

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FIG. 6



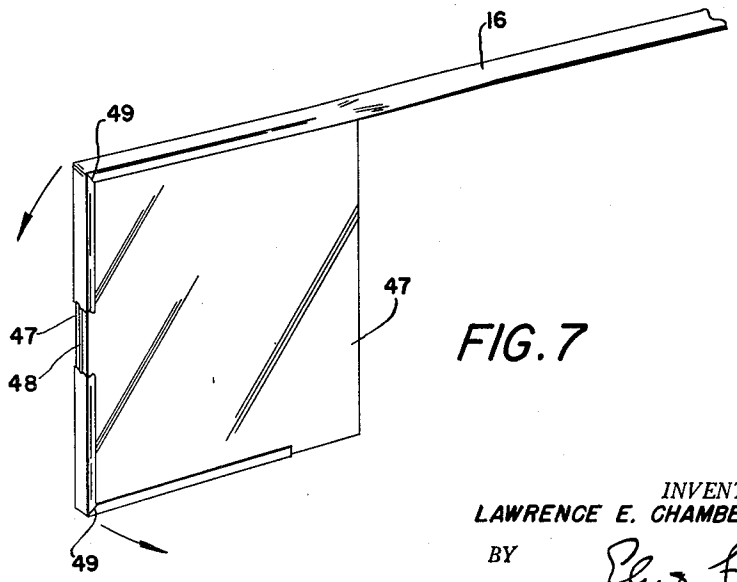


FIG. 7

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UNITED STATES PATENT OFFICE

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SLIDE BINDER CLAMPING APPARATUS

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Application December 1, 1950, Serial No. 198,627

12 Claims. (Cl. 154—1.6)

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This invention relates to improvements in slide binder clamping apparatus used in binding together glass slides having photographic film transparencies placed between the slides.

Several devices have been proposed for holding glass slides with a film transparency therebetween while tape is bound around the edges of the slides whereby the transparency is protected by the slides and the tape binding. One of the objects of this invention is to provide an apparatus which is an improvement upon these prior devices, which is simple in construction, which requires relatively few parts which permits quick and easy application of the tape of the slides, and which permits unrestricted rotation of the slides while the tape is being bound thereon.

Another object is to provide an apparatus of the type referred to having quickly releasable and quickly engageable rotatable clamping discs for holding the slides properly while the binding tape is placed thereon.

A further object is to provide novel means for quickly separating the clamping discs and for holding them apart when it is necessary to remove bound slides and replace them with others to be bound. Specifically, such means embodies a set of balls arranged in semi-spherical depressions formed in one of the clamp supports and in a freely mounted operating disc, whereby rotation of the operating disc will cause axial movement of one of the clamp shafts to separate the clamping discs and hold them apart until further rotation of the operating disc permits the axially movable clamp shaft to be returned by spring action.

Other objects and advantages will become apparent from the following description taken in conjunction with the accompanying drawings.

In the drawings:

Fig. 1 is a top plan view,

Fig. 2 is a partial section taken substantially on line 2—2 of Fig. 1,

Fig. 3 is a side elevation taken in the direction indicated by line 3—3 of Fig. 1,

Fig. 4 is a side elevation of the clamping discs in open position,

Fig. 5 is a partial top plan of the clamping discs in open position, taken in the direction indicated by line 5—5 of Fig. 4,

Fig. 6 is a transverse section taken substantially on line 6—6 of Fig. 1, and

Fig. 7 is a perspective view of two glass slides with a transparency therebetween with binding tape partially applied thereto, part of the tape being broken away for clarity.

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Referring to the drawings, the numeral 10 designates a generally rectangular base having an integral, uniform, downwardly extending flange 11, and a plurality of rubber feet 12, in this instance one at each corner of the base, arranged to support the base slightly above a table or the like, as indicated in Fig. 3.

Adjacent the rear of base 10 a vertical support or post 13 is suitably fixed to the base, and carries a shaft 14 near its upper end, on which shaft a reel 15 carrying a supply of binding tape 16 is rotatably mounted. In this instance shaft 14 takes the form of a threaded bolt having an integral head 17 at one end, while a nut 18 is threaded on the other end of the shaft. A split dished, friction washer 19 is mounted between head 17 and reel 15, the arrangement being such that freedom of rotation of reel 15 may be controlled by tightening or loosening nut 18.

Near the front of the base 10 a pair of spaced, vertical clamp supports or posts 20 and 21 are suitably secured to the base. In this instance posts 20 and 21 are secured by screws 22 which extend through the base 10 and into the hollow body portion of the posts. Posts 13, 20 and 21 are substantially similar in construction and arrangement, except that posts 20 and 21 face each other as shown in Fig. 6, while the outer surface of the upper portion of post 21 is provided with depressions which will be referred to later.

In its upper portion, post 20 carries a fixed clamp shaft 23 which is threaded into the post and locked in desired position by a lock nut 24. The inner end of shaft 23 is enlarged as at 25 and receives a threaded stub shaft 26 on which a clamping disc 27 is freely rotatable. The inner face of disc 27 is provided at its outer end with an annular rubber friction member 28, bonded or otherwise suitably secured thereto.

Post 21, in its upper portion, carries a rotatable clamp shaft 29 which is also axially movable in the post under certain conditions. The inner end of shaft 29 is enlarged as at 30 and has a clamping disc 31 secured on the end thereof so as to be rotatable with the shaft 29. In this instance disc 31 is tightly secured to the end of shaft 29 by means of a small screw 32 threaded through the disc and into the shaft. An annular rubber friction member 33, similar to member 28, is bonded or otherwise secured to the inner face of disc 31 at its outer end. Surrounding shaft 29 between its enlarged end 30 and a washer 34 which abuts the post 21, is a coil spring 35 which has a normal bias tending to move shaft 29 and disc 31 axially toward disc 27.

The outer end of shaft 29 is threaded at 36 to receive the threaded sleeve portion 37 of a turning knob 38 which is locked in desired position on shaft 29 by a small locking screw 39 threaded into the knob. Between the inner end of sleeve 37 and the outer face 40 of the upper end portion of post 21, an operating disc 41 having a thumb engaging projection 42 is rotatably mounted on shaft 29. The outer face 40 of post 21 is provided with a plurality of spaced, semi-spherical depressions 43, in this instance three, each of which depressions receives a ball 44 of slightly less diameter than the diameter of said depressions. A similar number of semi-spherical depressions 45 slightly larger in diameter than balls 44 is also formed in the inner face 46 of operating disc 41. When the faces 40 and 46 are in contact, each depression 45 is opposite and substantially complemental to one of the depressions 43 so that substantially completely round cavities are then provided for the balls 44. In the contacting position of the faces 40 and 46, shaft 29 and disc 31 are in their innermost position, as indicated in Figs. 1 and 3, as well as in the solid line position of Fig. 6.

Now, if the operating disc 41 is turned by means of the thumb projection 42, the depressions 45 will act as cam surfaces riding outwardly on balls 44, which act as cams, thus forcing the disc 41 to move outwardly, as indicated in Figs. 4 and 5, and in the broken line position of Fig. 6. Since the outer face of disc 41 is in contact with the inner end of sleeve 37, outward movement of disc 41 will also move knob 38, shaft 29 and disc 31 outwardly against the action of spring 35, so that the clamping discs 28 and 31 are then separated to their greatest extent. As long as depressions 45 are out of contact with balls 44, as indicated in Figs. 4 and 5, the clamping discs 27 and 31 will remain in their extreme separated position, and this position may be maintained even though the thumb is removed from projection 42. When operating disc 41 is rotated from its position in Figs. 4 and 5 to its position in Figs. 1 and 3, depressions 45 will again become complemental to depressions 43, and spring 35 acting against the enlarged head 30 of shaft 29 will return all the axially movable parts to their innermost position. Thus, the balls 44 and the semi-spherical depressions 43 and 45 provide rolling cam means for quickly separating the clamping discs 27 and 31, while the spring 35 provides means for quickly returning the clamping discs to clamping position.

In use, a pair of rectangular shaped glass slides 47 having a film transparency 48 located between them, is placed between the open clamping discs 27 and 31, as indicated in Fig. 5. The operating disc 41 is now rotated sufficiently to permit disc 31 to move into engagement with one slide 47 and efficiently clamp the slides and transparency between the discs 27 and 31, as indicated in Fig. 1 and in the full line position of Fig. 6. It will also be observed from Figs. 1 and 3 that when the slides and transparency are properly clamped between the clamping discs, they are in proper alignment with the reel 15 so that binding tape 16 may be pulled from the reel and its adhesive side placed into contact with the upper edge of the slides. Since the tape 16 is wider than the combined edges of the slides, part of the tape is pressed on the sides of the slides for better adhesion. When a corner is reached, the side portions of the tape may be slit, as at 49, to permit an overlap at this point. After the upper edge has been taped, the slides may be rotated to bring up the next and succeeding edges until the taping operation is complete. Rotation of the slides may be accomplished by merely turning the knob 38, which will rotate shaft 29 and disc 31, and since disc 27 is freely rotatable on sub-shaft 26, the frictional engagement between members 28 and 33 on the clamping discs, and the side faces of the glass slides held between the discs, is sufficient to permit rotation of the slides and transparency.

When the taping operation on one pair of slides is completed, the clamping discs may be quickly separated by rotating the operating disc 41 to the position shown in Figs. 4 and 5, to permit ready removal of the finished slides. A new pair of slides and a transparency may then be placed in position against disc 27 and disc 41 is then rotated to its position in Figs. 1 and 3, after which spring 35 will move clamping disc 31 so that the slides will be quickly and properly clamped, ready to be taped.

While I have shown and described one form of the invention, it will be understood that the invention is not limited to this form, and that changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the subjoined claims.

What is claimed is:

1. In apparatus of the character described, a base, a pair of separable clamps mounted upon said base and adapted to support glass slides therebetween, means for directing binding tape to the top edge of said slides, and rolling cam means for separating said clamps.

2. Apparatus of the character defined in claim 1 wherein after separating said clamps said rolling cam means holds said clamps in separated position, and spring means to return said clamps to clamping position.

3. In apparatus of the character described, a base, a pair of spaced supports mounted on said base, a rotatable clamp carried by each support, at least one of said clamps being axially movable toward the other clamp so as to support glass slides between the clamps and movable away from the other clamp to separate the clamps, means for directing binding tape to the top edge of said slides, and rolling cam means for axially moving said movable clamp to separate the clamps.

4. Apparatus of the character defined in claim 3 wherein after separating said clamps said rolling cam means holds said clamps in separated position, and spring means to axially move said movable clamp to clamping position.

5. In apparatus of the character described, a base, a pair of spaced vertical posts mounted upon said base, a fixed horizontal shaft mounted on one of said posts and carrying a clamping disc at its inner end, an axially movable horizontal shaft mounted on the other post and carrying a clamping disc at its inner end, spring means for moving said movable shaft and disc toward said fixed shaft and disc, and rolling cam means for moving said movable shaft and disc away from said fixed shaft and disc, said last named means also holding said clamping discs in separated position.

6. Apparatus of the character described in claim 5 wherein said rolling cam means comprises an operating disc rotatable on said axially movable shaft and having a plurality of semi-spherical depressions therein, said post for said movable shaft also having a plurality of semi-

spherical depressions therein complementary to said first depressions, and balls located in said depressions.

7. In apparatus of the character described, the sub-combination of a pair of spaced vertical supporting posts, a fixed clamp carried by one of said posts, an axially movable clamp carried by the second post, spring means for moving the latter clamp toward the fixed clamp, and means for moving the movable clamp away from said fixed clamp against the action of said spring means comprising, a shaft fixed to said movable clamp and movable axially in said second post, a plurality of spaced semi-spherical depressions in one face of said second post, a ball carried in each depression, and an operating disc rotatable on said shaft and having a semi-spherical depression to receive each ball, the arrangement being such that upon rotation of said operating disc said balls act as cams to axially move said disc, said shaft and said movable clamp.

8. A sub-combination as defined in claim 7 wherein the diameter of said depressions is slightly greater than the diameter of said balls.

9. A sub-combination as defined in claim 7 wherein said operating disc remains in fixed position after said rotation until further rotation of said disc aligns the depressions in said disc and said second post respectively.

10. In apparatus of the character described, the sub-combination of a supporting post, an axially movable shaft carried by said post, a clamping disc on one end of said shaft, a sleeve fixed on the other end of said shaft, spring means between said disc and said post for axially moving said shaft in one direction, an operating disc between said sleeve and said post and rotatable on said shaft, rolling cam means cooperating with said post and said operating disc whereby upon rotation of said operating disc said shaft will be axially moved in the opposite direction, and a second clamping disc in operative relation with said first clamping disc.

11. A sub-combination as defined in claim 10 wherein said rolling cam means includes spaced semi-spherical depressions located in adjacent faces of said post and said operating disc, and balls in said depressions.

12. A sub-combination as defined in claim 10 wherein said rolling cam means includes spaced semi-spherical depressions located in adjacent faces of said post and said operating disc, and balls in said depressions, said depressions in said operating disc being of slightly greater diameter than the diameter of said balls.

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