Dec. 13, 1938. A. O. JOHNSON 2,140,186

MACHINE FOR ATTACHING DECALCOMANIA FILMS ABOUT CYLINDRICAL OBJECTS

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Fig. 1.

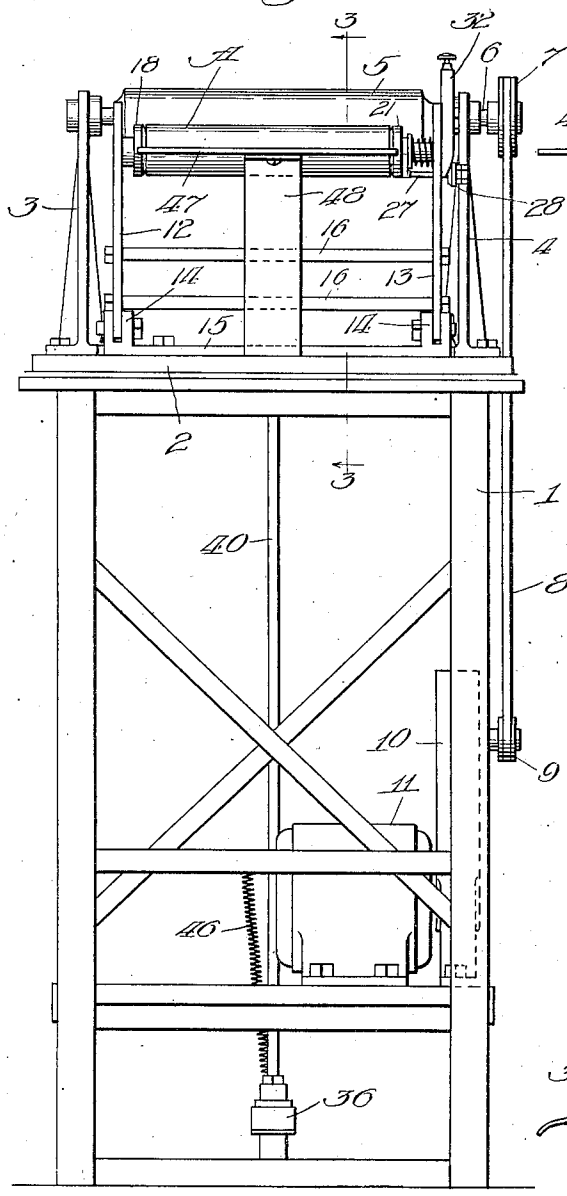
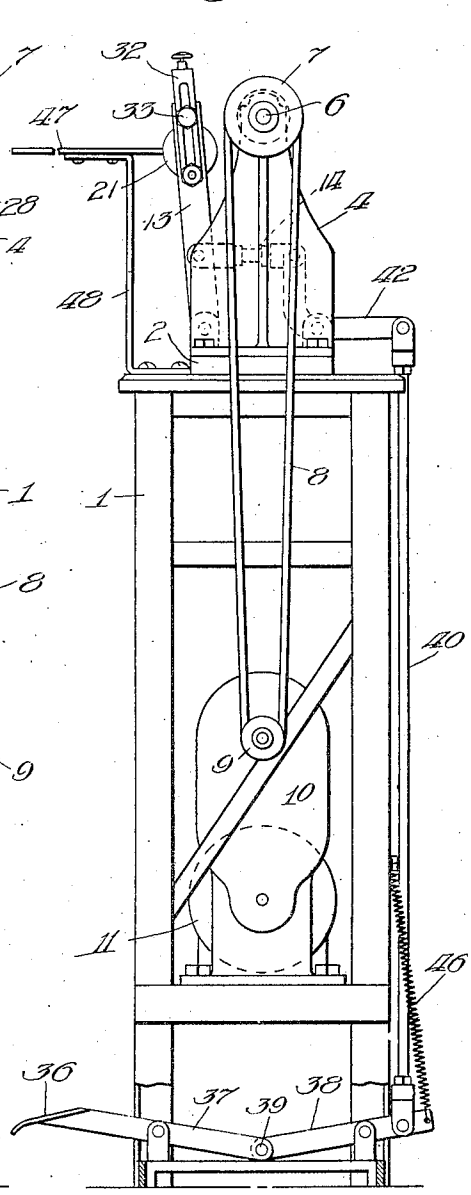


Fig. 2.



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Fig. 3

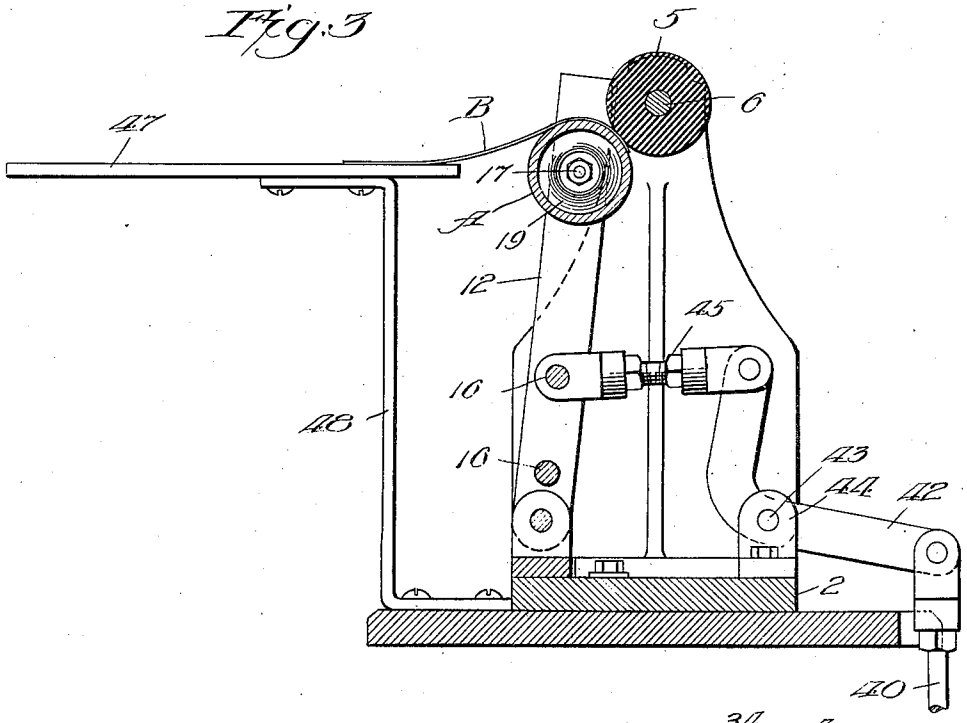


Fig. 4.

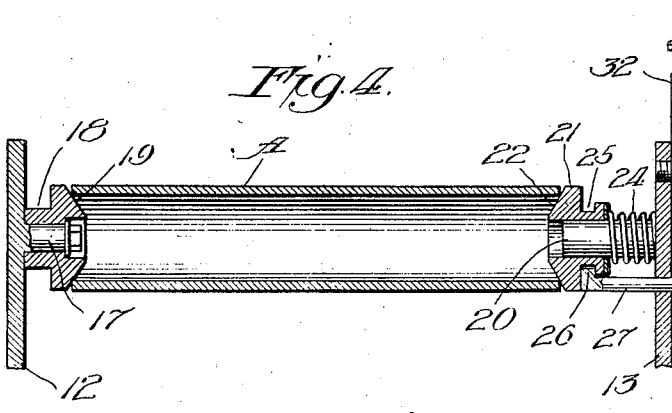


Fig. 5.

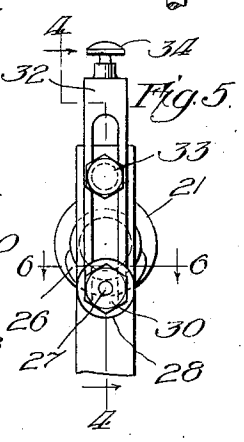
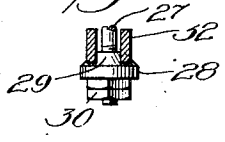


Fig. 6.



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MACHINE FOR ATTACHING DECALCOMANIA FILMS ABOUT CYLINDRICAL OBJECTS

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5 Claims. (Cl. 41—1)

It is frequently desirable to encase or sheath pieces of tubing with decalcomania films in order to produce decorative effects. When these films are transferred by hand, in the usual way, great care must be taken to obtain a smooth unwrinkled effect.

The object of the present invention is to produce a simple and novel machine whereby decorative films may be applied to tubes or other cylindrical members with rapidity and ease.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a front view of a machine embodying the present invention; Fig. 2 is a side view of the machine; Fig. 3 is a section, on a larger scale, on line 3—3 of Fig. 1; Fig. 4 is a section through a tube to be decorated and the immediate supports therefor; the section being approximately on line 4—4 of Fig. 5; Fig. 5 is an edge view of the holder showing the same edge as that which appears in Fig. 2, but being on a larger scale; and Fig. 6 is a section on line 6—6 of Fig. 5.

Referring to the drawings, 1 represents a suitable framework constituting an open work base. The film-applying mechanism is supported on top of this base structure. The upper structure is shown as comprising a frame for the movable parts; this frame consisting of a slab 2 resting on top of the under structure and having two pedestals 3 and 4 rising from the same toward the ends thereof. Arranged between the upper ends of these pedestals is a horizontal, rotatable roller 5 of rubber or other yieldable or cushioning material. The roller is provided with a shaft 6 that projects outwardly from one of the pedestals and has thereon a wheel or pulley 7 over which runs a belt 8 driven by a small wheel or pulley 9 forming the driving element of a speed changing mechanism 10 driven by an electric motor 11 housed within the main framework or base.

Arranged in front of the roller 5 is a more or less vertical, rocking work support or holder. In the arrangement shown, this holder comprises two vertical arms 12 and 13 each lying just inwardly from one of the pedestals 3 and 4. Each arm is hinged at its lower end, as indicated at 14, to a rugged bar or plate 15 overlying and secured to the slab member 2; the hinge axes being aligned and being parallel to the axis of the roller. The members 12 and 13 are connected together, toward their lower ends, by rods or bars 16 spaced apart from each other. The upper ends of the members 12 and 13 are provided with means for rotatably supporting a cylindrical piece of work with its axis parallel to the roller; whereby, when the hinged holder device is swung rearwardly toward the roller, the latter will engage the work and cause it to turn whenever the roller is revolving.

In the arrangement shown, the work engaging means is adapted for supporting pieces of tubing and, for the sake of brevity, only this specific arrangement will be described. As best shown in Fig. 4, the arm 12 has thereon, near its upper end, an inwardly projecting stud or stub shaft 17 paralleling the roller. Rotatably mounted on the part 17 is a member 18 having a cone-shaped end 19 adapted to enter one end of a piece of tubing A. The arm 12 is also provided with an inwardly projecting stub shaft 20 in alignment with the shaft 17. Upon the stub shaft 20 is a member 21 similar to the member 18, the same being provided with a frusto-conical end 22 adapted to enter the other end of the tubing. The shaft 21 is made long enough so that the member 21 may slide lengthwise thereof between a working position, as shown in Fig. 4, and a release position in which it stands clear of the end of the tubing and permits the latter to be removed. Surrounding the shaft 20, behind the member 21, is a compression spring 24 which acts constantly in a direction to force the member 21 against the work. The member 21 may be retracted, against the resistance of the spring in any suitable manner. In the arrangement shown, the member 21 has a hub provided with an annular groove 25 in which is engaged a fork 26 carried on a stem 27 that passes through the arm 12 and projects outwardly beyond the latter. On the outer end of the stem 27 is a washer 28 having a frusto-conical face 29 on the side facing the member 13. On the stem, outwardly from the washer, are suitable nuts 30. Straddling the stem 27 between the arm 13 and the washer 28 are the points of the prongs of a two-prong fork 32 which constitutes a wedge device. A suitable bolt 33, extending between the prongs of the fork and into the arm 13, serves to hold the fork against the outer face of the arm and, with the stem, serves to guide the fork in its up and down movements. On the upper end of the fork is a button or head 34.

Assuming that there is a tube in the hinged holder and that it is desired to release the same,

downward pressure is applied to the head or button 34, causing the wedge-shaped lower end 35 of the fork to press against the washer and force the latter away from the arm 13. The stem 27, of course, moves with the fork and therefore draws the holding member 21 toward the right, as viewed in Fig. 4, and away from the tube A. By pushing the fork 32 down far enough, the wedge face 35 passes beyond the washer, and the latter engages with the outer vertical face of the fork; the fork thus locking the holding member 21 in its release position until the fork is lifted by its head or button.

The hinged holder device may be swung back and forth in any suitable way. In the arrangement shown, there is a foot pedal 36 projecting forwardly from the base structure of the machine, near the floor. This pedal is on one end of a rocking lever 37 whose other end is pinned to one end of a second rocking lever 38, as indicated at 39. Connected to the other end of the lever 38 is a rod 40 extending up past the top of the frame structure or base 1. There the upper end of the rod is connected to one arm of a bell crank lever 42 pivotally supported, as indicated at 43, on a suitable bracket 44 resting on and secured to the slab 22 along the rear marginal portion thereof. The other arm of the bell crank lever 42 extends upwardly and is connected to one of the rods 16 of the swinging holder device by an adjustable connecting rod 45. A tension spring 46 is connected at its lower end to the rear end of the lever 38 at the bottom of the machine, and is anchored to the frame structure 1 at a somewhat higher point. This spring is strong enough to overcome any tendency on the part of the treadle-actuated operating means for the swinging holder to swing the holder toward the roller. The spring is preferably made strong enough to insure that the work holder will stand in an idle position except while the pedal is being depressed. There is another reason for insuring that the work will always have a tendency to move away from the roller. As will be seen, there is a small horizontal table or shelf 47 supported on a suitable bracket 48 from the top of the base or frame structure 1; this table lying in front of a tube in the holding device and, conveniently, in about the horizontal plane containing the axis of rotation of the work. By employing a spring strong enough to tend constantly to force the work away from the roller, the work may normally be held against the rear edge of the table or shelf 47.

In using the machine, a piece of tube is inserted in the holder and, before or after this is done, is covered with a suitable adhesive. In the meantime, a decalcomania has been dropped in a tub of water so as to loosen the ink film from the paper and cause the paper to drop off. The ink film, indicated at B in Fig. 3, is lifted out of the water and laid on the table or shelf 47 with one edge lying against the tube. Upon depressing the pedal, the holder for the tube is swung rearwardly from the position illustrated in Fig. 2 to that of Fig. 3, causing the film to be drawn rearwardly by the tube and the tube to come in contact with the roller. Assuming that the roller is rotating in the counter-clockwise direction, as viewed in Fig. 3, the roller will be driven thereby in the clockwise direction. As the turning movement of the tube progresses, the decalcomania film B is drawn rearwardly and caused to lay itself smoothly upon the tube. As soon as the advance edge of the decalcomania film reaches the roller, the roller exerts a pressure on the same which forces it into intimate contact with the tube and smooths it. A single turn of the tube completes the application thereto of the decalcomania film, although it may be given any desired number of turns. When the operator takes his foot off the treadle, the spring throws the swinging holder forward. The decorated tube may now be removed in the manner heretofore described, and another tube be inserted in the holder.

It will thus be seen that I have produced a simple and novel machine for quickly and easily wrapping a decalcomania film around a tube or other cylindrical member, depending upon the nature of the holding devices adapted to grip the work, and insuring that the film will be smooth and unwrinkled and that it is placed in intimate contact throughout its entire length and width, with the periphery of the object for which it forms a sheathing. If the surface of the roller were hard, it could not adapt itself to small irregularities in the contour of the work; but, being composed of soft rubber or other yieldable cushioning material, the roller adjusts itself to every slight depression or elevation that may exist in the surface of the work. It will also be seen that it is a simple matter to remove and replace a piece of work, so that a large number of pieces may be successfully decorated in a comparatively short time.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. In a machine for attaching decalcomania films or the like about a cylindrical object, a supporting member, a rotatable horizontal roller mounted on said member, a horizontal table on said member in front of and spaced apart from the roller, a holder movably mounted on said member for rotatably supporting said object in front of and parallel to the roller and between the latter and the table, means to shift said holder to move the said object into and out of engagement with the roller, and means to rotate the roller.

2. In a machine for attaching decalcomania films or the like about a cylindrical object, a supporting member, a horizontal roller rotatably mounted on said member, a table on said member in front of and spaced apart from said roller, a holder rising from said supporting member through the space between the table and the roller, means at the upper end of the holder to support said object for rotation about an axis parallel to the roller, a hinge connection between the lower end of the holder and the said supporting member, means to rotate the roller, and means to swing said holder back and forth to carry said object into and out of engagement with the roller.

3. In a machine for attaching decalcomania films or the like about a cylindrical object, a support, a rotatable roller of soft rubber or other cushioning material mounted on said support, a holder for rotatably supporting said object parallel to the roller also mounted on said support, means to rotate the roller, and means to shift said holder back and forth to carry said object into and out of engagement with the roller.

4. In a machine for attaching decalcomania

films or the like about a cylindrical object, a support, a rotatable roller mounted on said support, a holder also mounted on said support and having thereon members rotatable about an axis parallel to that of the roller and adapted to engage the ends of said object to support it, one of said members being movable axially from and toward the other, a spring acting on the axially-movable member in the direction to move it toward the cooperating member, a shifting device engaged with the axially-movable member, a manually-operable cam device acting on said shifting device to move it and cause the said object to be released from the holder, and means to shift the holder to carry said object into and out of engagement with said roller.

5. In a machine of the character described, a holder having two parallel arms, two axially aligned, separated work-engaging elements rotatably mounted on said arms, the mounting for one of said elements being such that that element may move axially into and out of engagement with a piece of work, a spring acting on the said shiftable element in a direction to move it away from its supporting arm into work-engaging position, a shifting device engaged with said shiftable element and having a stem extending parallel with the axis of rotation of said elements through the corresponding arm of the holder, a head on the stem outwardly from the latter arm, and an operating means for said shifting device including a wedge device slidable lengthwise of the latter arm underneath said head and straddling said stem.

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