The present invention relates to apparatus for applying flat supports to the backs of advertising posters. More particularly, it relates to an apparatus for the continuous application of flat supports to the backs of thin sheets by gluing.

Advertising posters, and the like, are customarily prepared by printing on sheets of paper of varying sizes which because of their size and thinness require supporting when used for display purposes. This is usually accomplished by pasting or gluing the printed sheet to a board or other support—usually cardboard—of sufficient thickness and rigidity to give adequate support to the sheet. This gluing operation is both expensive and messy and various types of apparatus have been proposed for this purpose. These, however, have not been entirely satisfactory for various reasons and the apparatus of the present invention is designed to overcome the defects and disadvantages of these previous forms of apparatus.

The apparatus of the present invention comprises a table or support for the support, such as cardboard, to be attached to the sheets. This table, which can be raised as the supports are removed from it, has a carriage which can be moved transversely, and to which is attached a support device to pick up the flat supports, and which may also be raised and lowered in order to facilitate getting hold of any, raising the uppermost support from the pile.

After shifting the carriage to bring the support over a second table on which the advertising, or other, sheet lies face down, the support to which an adhesive has been applied by an adhesive depositing device is lowered into contact with the prepared sheet, the suction released and the support pressed onto the sheet.

In the prior art devices of the above type, the carriage had only a single degree of motion and could be only moved back and forth along the carrying track. The carriage carried a vertically shiftable stamp or punch to the upper end of which the suction device was attached. The upper end of the stamp or punch was supported upon a rod upon which it could slide and which could be tilted around an axis. The rod was connected to a steering device by which it was turned whenever the punch was located either above the pile of supports to be attached to the sheets, or above the sheet to which the support was to be attached. The supporting of this punch by a tiltable frame, upon which the stamp or punch must be able to slide horizontally, is both complicated and its construction is such that it is subject to excessive wear and tear. Furthermore, the punch must be guided vertically inside the carriage. The guide system provided for this purpose likewise serves as an entrapment unit for the punch whenever the carriage is shifted. In order to avoid any danger of binding, seizing, jamming, etc., the rod which guides the punch and the track must be very accurately guided in parallel. Because of the fact that during the sliding motion of the upper end of the punch, friction occurs upon the rod, the vertical guiding system of the carriage for the punch, during the motion of the carriage, will constantly be under a bending stress. As a result of this, after a relatively short period of operation, jamming of the apparatus occurs and both guide systems are rapidly ruined. Accordingly, after a relatively short period of operation, it is no longer possible to obtain an accurate vertical alignment of the punch with the suction device above the sheet to which the support or other object is to be attached, as well as above the supports or other object to be attached to the sheet.

The apparatus of the present invention overcomes the above difficulties and disadvantages inherent in the prior devices of this kind in that it provides for the accurate, vertical alignment of the suction device above the sheet to which the support, or other object, is to be attached by gluing or otherwise, as well as above the supports, or other objects, which are to be removed from the pile. This accurate vertical alignment is still possible even after long operation of the apparatus and hence supervision and maintenance of the apparatus are reduced to a minimum.

The apparatus of the present invention for the attachment, as by gluing, of flat articles to another object as, for example, back supports to sheets such as advertising posters, comprises essentially a table to support piles of flat articles, the table being provided with a carriage which can be moved transversely, and to which is attached a suction device which can be raised and lowered and which serves to pick up and raise the uppermost flat article from the pile on said table and, after a corresponding motion of the carriage, for the lowering of the said flat article and for pressing it against a sheet which lies ready upon a supporting table. Simultaneously with the latter operation, the suction is released from the suction device. Between the time the flat article is raised from the pile and lowered, its lower side is brought in contact with an adhesive spreading device so that when the flat article is brought into contact with the sheet they will be glued together. The suction device of the present invention is supported so that it can tilt around an axis running parallel to the motion of shifting of the carriage, so that the driving of the carriage occurs via a sliding block connected to a chain or belt which passes over four change-of-direction rollers, whereby the said sliding block is directed in a guide which runs at a right angle to the shifting direction of the carriage. The tilting motion of the tilting arm occurs via a guide-arm which is located at the sliding block, which guide arm is in effect operationally connected with a guiding curve at the tilting lever.

The sliding block which is guided between the guide tracks, is attached to said chain via a rotatable bearing. Furthermore, in the device of the present invention, the flat article which adheres to the suction device is carried with the shifting of the carriage across a deposition roller which dips into a glue bath. A still further improvement consists in the fact that the drive of the deposition roller is derived from the motion of the carriage. In this manner, the peripheral velocity of the glue-depositing roller at any moment is roughly equal to the shifting speed of the carriage, and in this way the sliding motion which may take place between the deposition roller and the support upon which the glue is being deposited is prevented; instead the roller will roll without difficulty along the support to which the glue is being applied. Such a sliding may indeed have as a consequence, the displacement of the support which adheres to the suction-grasping device with respect to the carriage, with the result that a correct and accurate placement of the support upon the advertising poster, or other sheet, can no longer be assured. According to another feature of the present invention, this correct movement of the roller along the support is accomplished by the provision of an endless tension band which is guided around two rollers, and which has two tracks arranged parallel to the direction of shifting of the carriage, one track being connected to the car-
riage, whereas the other is wrapped at least once around the shaft of the glue-depositing-roller, so that the deposition roller is always turned when the carriage is moved. It is preferred to place the deposition table at an angle, and that it have a highly polished surface, so that the operator, at the deposition of the advertising posinters, will immediately note whether the picture is positioned correctly with respect to the glue being applied.

The invention will now be described with reference to the attached drawings.

FIGURE 1 shows schematically the table arrangement; FIGURE 2 shows a section through the carriage at the height of the vertically running slit; FIGURE 3 shows a section through the sliding block; FIGURE 4 shows schematically the action of the tilting motion; FIGURE 5 shows a side view of the apparatus in which is shown as a section at the height of the laterally movable table; and FIGURE 6 shows a frontal view of the apparatus, partially in section.

Upon the pile table 12, the supports of the same size are piled on top of each other, being guided by the electrical central drive 13. The pile-table 12 is moved upwardly, the stroke being regulated by the hoisting device 14 provided with cogwheels. The central drive 13 also moves the carriage 1 by the aid of a chain 4. This carriage 1 has adjustable suction parts 18 and always lifts the upper cardboard support from the pile by the action of air-suction and holds the support by vacuum, and moves forwardly. The support is thereby brought into contact with the metal roller 16 which runs inside a glue bath 17 and thus deposits strips of glue. Thereafter, the carriage 1 continues to move the support forward. When reaching the forwardmost position, the carriage tilts downwardly and in this manner presses the support upon the backside of the advertising poster, or other object, which rests upon the table 18 located directly underneath it.

The pile table 12, by releasing the lever handle 19, can be moved downwardly in each position.

The carriage 1 in its direction of motion is directed across four rollers 5 and 5' along the two tracks 6 and 6'. It has perpendicular to its direction of motion two guide tracks 2 and 2'. Between the two guide tracks is placed a sliding block 10 which is attached to the chain 4 via a rotatable bearing.

During the longitudinal motion of the sliding block 10, it is located at the upper or lower position between the guide tracks, so that the carriage is carried along at a speed depending upon the velocity of the chain, in one or the other direction of movement. During the transverse motion of the sliding block, the carriage comes to a standstill, when the sliding block between the guide tracks slides from its top into its bottom position, and vice versa, depending upon the velocity of the chain.

The velocity of the carriage during its shifting motion is constant. The accelerations and decelerations in the terminal positions depend upon the chain velocity and the diameter of the change-of-direction rollers 60 for the chain.

During the time the carriage is standing still, the tilting motion of the tilting arm 11 takes place which has its fulcrum and bearing at point 3 of the carriage. In order to guide the tilting motion, the transverse motion of the sliding block is used, i.e., the sliding of this block in the guide tracks. In order to accomplish this, the sliding block carries a contact roller 8, which runs along the control curve 7 to the tilting arm 11.

What is claimed is:

1. Device for the gluing of flat articles to other flat articles comprising an elevatable table on which flat articles can be stacked, a carriage movable transversely and to which is attached a suction device which can be raised and lowered which can grasp and lift the uppermost flat article from a pile on said table, a carriage which can be moved transversely, and to which is attached a suction device which can be raised and lowered and whereby the uppermost flat article stacked on said table can be grasped and lifted, means for shifting said carriage, means for lowering of said flat article, means for releasing the vacuum holding said flat article, means for pressing said lowered flat article upon a sheet located below said transferred flat article, means between said raising and lowering of said flat article whereby a glue-depositing-device applies glue to the surface of said flat article to be brought into contact with said sheet, means whereby said suction device is supported upon said carriage so that it may tilt around an axis which runs parallel to the direction of motion of the said carriage, whereby the driving of the said carriage occurs via a sliding block connected to a belt which runs across four change-of-direction rollers, whereby the sliding block is guided in a guide channel of the said carriage which runs perpendicular to the direction of motion of the said carriage.

2. The device of claim 1 wherein the tilting motion of the tilting arm occurs via a guide element arranged at the sliding block, which element is connected to a guiding curve at the tilting lever.

3. The device of claim 1 wherein the sliding block 4 which is guided between the guide tracks (2') and (2''), is attached to the chain (4) via a rotatable bearing (9).

4. The device of claim 1 wherein the glue-deposition roller (16) is driven by the motion of the carriage (1).

5. The device of claim 1 wherein there is provided a tension band (21) guided by an endless belt around two rollers, and which has two tracks which lie parallel to the direction of shifting of the carriage (1), one of which tracks is connected to the said carriage and the other said track being wrapped at least once around the shaft of the glue-deposition roller (16), so that the said deposition roller is turned whenever the said carriage is moved.

References Cited

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