April 3, 1928.

1,664,898

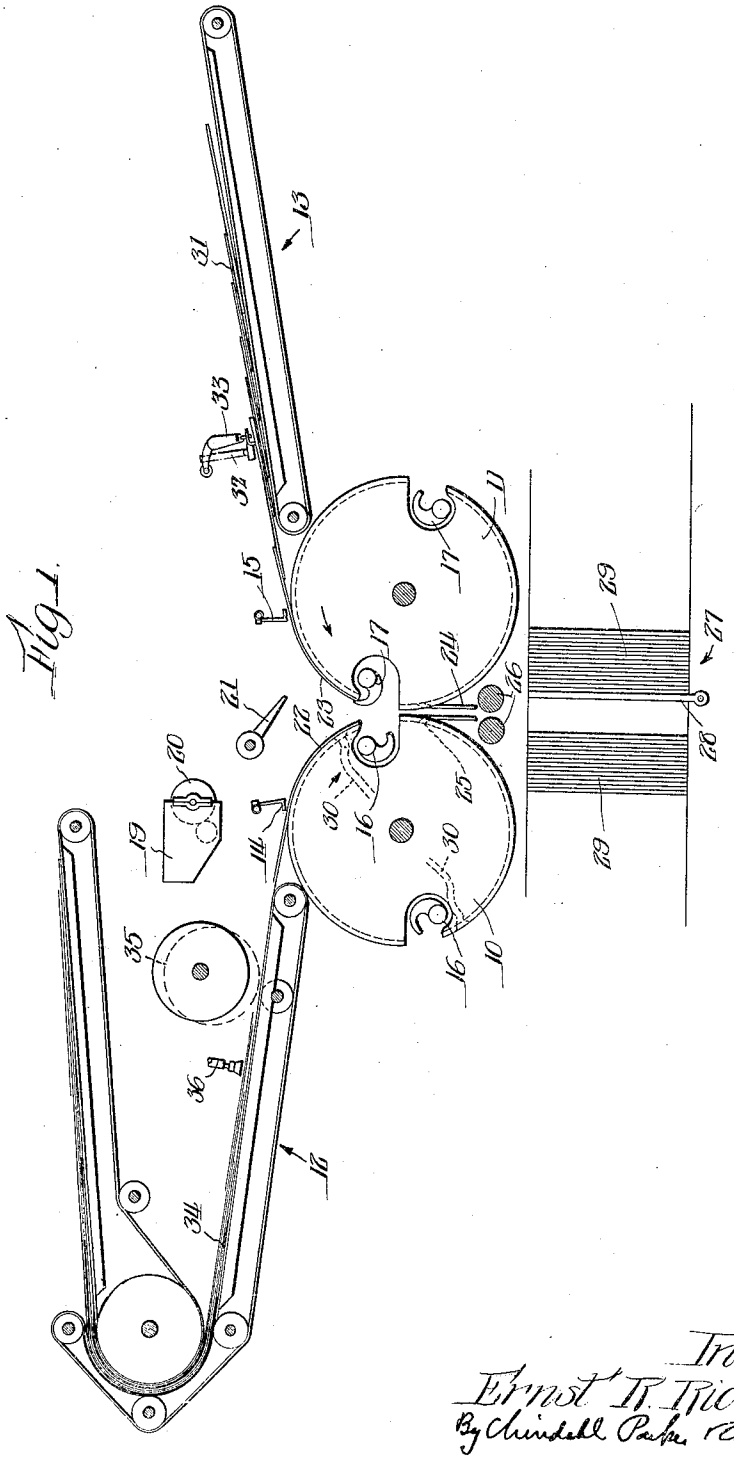
E. R. RICHARDS

TIPPING MACHINE

Filed June 7, 1926

2 Sheets-Sheet 1

Fig. 1.



Inventor:
Ernst R. Richards,
By Crindell Parker Carlson
Attys.

April 3, 1928. 1,664,898

E. R. RICHARDS

TIPPING MACHINE

Filed June 7, 1926 2 Sheets-Sheet 2

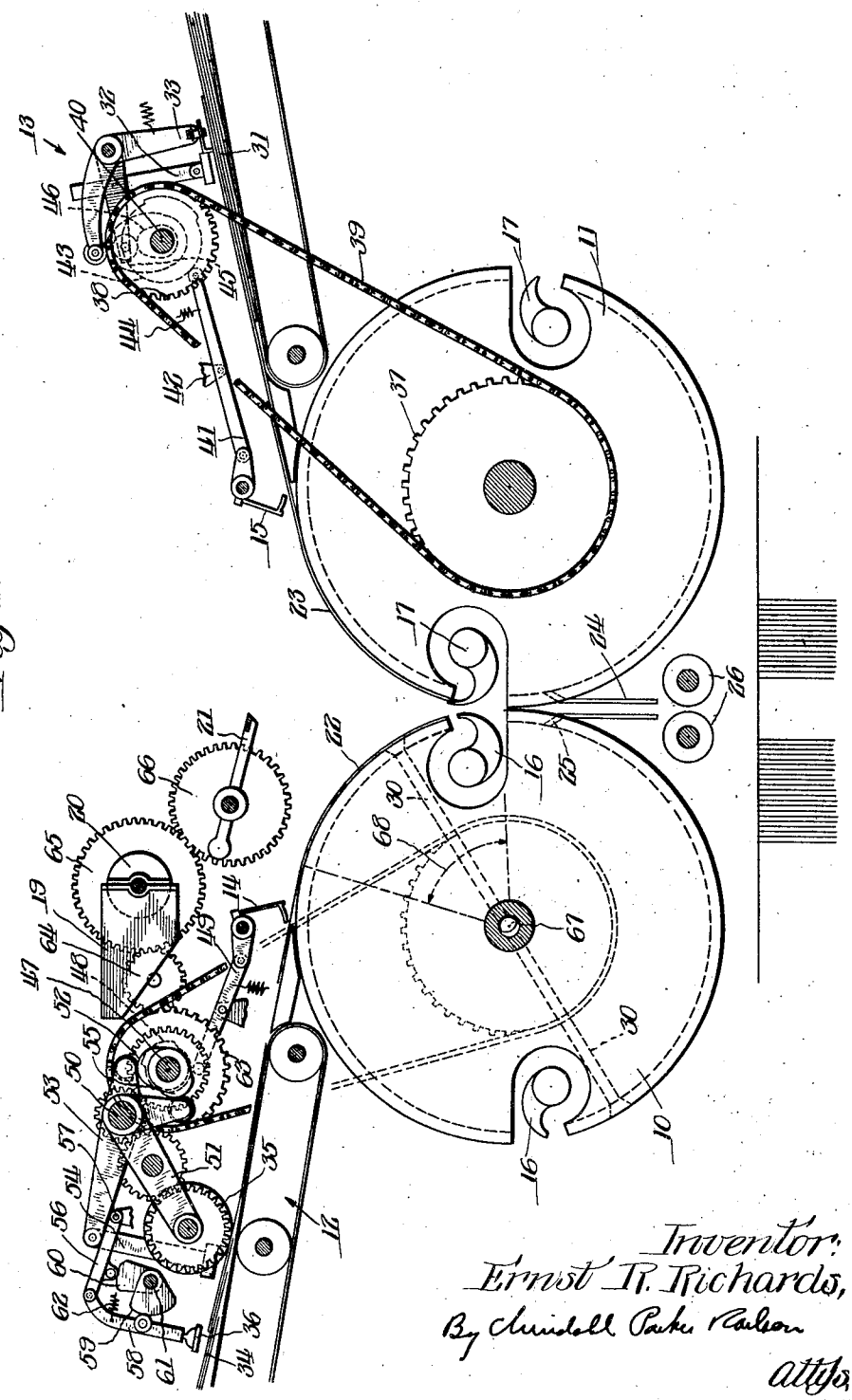


Fig. 2.

Inventor:
Ernest R. Richards,
By Crandell Parker Carlson
Attys.

Patented Apr. 3, 1928. 1,664,898

UNITED STATES PATENT OFFICE.

ERNST R. RICHARDS, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN ASSEMBLING MACHINE COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TIPPING MACHINE.

Application filed June 7, 1926. Serial No. 114,111.

My invention relates to what is known in the art as tipping machines, or devices for attaching two sheets or sets of sheets of paper together along one edge by pasting and pressing the edges together. These machines are chiefly used to attach a color insert or tip to a pamphlet or a section of a catalog, commonly called a signature.

One of the objects of my invention is to provide a machine that will operate with greater speed and efficiency than those at present in use.

Another object of my invention is to provide a novel means for holding a piece of material against a carrier after the grippers on said carrier have released their hold on the material.

Further objects an advantages of my invention will become apparent from the following description taken in connection with the accompanying drawings, in which

Figure 1 is a diagrammatic view illustrating all the essential elements of a device according to my invention.

Fig. 2 is a somewhat similar view of part of the machine showing the construction of as much of the mechanical transmission associated with the machine as is not old and well-known in the art.

The device according to my invention comprises a pair of continuously rotating carriers, mechanism for feeding sheets of pamphlet like sections to said carriers, means for applying paste to the pieces on one of said carriers and mechanism for receiving the assembled units from said carriers. Synchronous stops and grippers are employed for bringing the two parts to be united on to said carriers in properly correlated positions, and means for synchronizing the operation of both feeding mechanisms and of the paste applying mechanism are also provided.

Referring to the drawings 10 and 11 indicate a pair of cylinders continuously rotating in opposite directions so that their adjacent portions move downwardly as indicated by the arrows in Fig. 1. Automatic feeders indicated as a whole by the characters 12 and 13 are adapted to supply pieces of sheet like material to the carriers 10 and 11 respectively. A pair of stops 14 and 15 are associated with the carriers 10 and 11 and each carrier has two sets of grippers 16 and 17 respectively. In the operation of my machine, a pamphlet like section or signature is automatically fed forward against the stop 15 and the tip or insert is automatically fed forward against the other stop 14. As the leading edges of the spaces for the gripper elements 16 and 17 pass simultaneously under the stops 14 and 15 cam mechanisms swing these stops to one side and other cams swing the gripping elements quickly into operative position clamping the signature and insert against their respective carriers. A paste fountain 19 maintains the surface of the paste roll 20 wet with paste and a blade 21 is adapted to receive paste from the roll 20 and carry it down to apply it to the leading edge of the insert 22. The blade 21 is geared to the carrier 10 for synchronous operation so that it will register with the leading edge of each insert. In the device illustrated each complete rotation of the carriers 10 and 11 completes the pasting or tipping of two signatures, but it will be obvious that the carriers could be designed to handle any desired number of pieces in one revolution. For this purpose each carrier is provided with two sets of diametrically opposed grippers 16 and 17 and the paste blade 21 and stops 14 and 15 are geared to operate through two cycles during a single rotation of the carriers. In the position illustrated in Fig. 1, a signature 23 and an insert 22 have been gripped and carried down almost into position to be pressed. Strippers 24 each having a plurality of fingers 25 entering grooves in the carries 10 and 11 are adapted to separate the assembled units from the carriers in case they should stick and to guide them downwardly between rollers 26 into a packing box indicated in its entirety by the reference character 27. The packing box contains a fork 28 adapted to move from side to side as the successive units fall beside it and push them into two opposed piles 29. As this form of receiver is old and well-known in the art, further description thereof appears unnecessary.

It is necessary for the insert grippers 16 to be removed out of the way of the signature grippers 17 before the signature and insert make contact and it is of course also necessary for the signature grippers 17 to be moved out of operative position before the strippers 24 remove the assembled unit from the carrier. The cams

customarily employed for these grippers are therefore cut so that the insert gripper 16 rotates back into the position indicated in Fig. 1 before the carriers have brought the signature and insert into contact. To securely hold the insert in place on the carrier 10 after the gripper 16 has been moved back, air ducts 30 terminating at the surface of the carrier 10 near the edge of the gripper space are adapted to deliver suction during the motion of the insert after the gripper has been moved back and until the signature has been pressed against the insert.

The signatures 31 are fanned out as clearly indicated in the drawings and the pile is held in position by feet 32 which are automatically raised by cams at the proper time to permit the pusher 33 to slide the uppermost signature down against the stop 15. For feeding the inserts 34 which are too thin to be handled by a pusher I have devised novel means for quickly sliding an insert at the proper time down against the stop 14. This means comprises a continuously rotating roller 35 adapted to be dropped at the proper time from the position shown in full lines in Fig. 1 to the position in dotted lines, to engage and feed an insert down to the stop 14. A suitable insert lifter and puller comprising a suction foot 36 and driven by cams to lift the next insert and move it forward under the roller 35 at the proper time may be employed.

Referring to Fig. 2 in which I have illustrated the novel details of construction involved in my invention, the carrier 11 by means of suitable sprockets 37 and 38 and a chain 39 drives a main countershaft 40 at twice the speed of the carrier. A suitable rocking lever 41 mounted on a fixed pivot 42 carries a roller riding on a cam indicated in dotted lines at 43 and is adapted to operate the stop 15. The roller may be held in contact with its cam 43 by means of a suitable spring 44. A pair of cams 45 and 46 on the main countershaft 40 are adapted to simultaneously operate the pusher-foot 33 and the hold-down 32 raising the hold-down while the pusher-foot operates to slide the next signature into position.

The carrier 10 by a similar chain and sprockets drives another main countershaft 47 carrying a similar cam 48 for operating the stop 14 through the rock lever 49. A short stationary shaft 50 carries bell crank levers 51 with rollers adapted to engage suitable cams 52 on the main countershaft 47. The roller 35 is carried by the outwardly extending arms of the bell crank levers 51 and continuously driven from the main countershaft 47 by a suitable train of gears as illustrated. Another bell crank lever 53 pivoted on the shaft 50 carries the hold-down 54 which is also operated by a suitable cam 55 on the main countershaft 47. The lifter and puller comprises an arm 56 pivoted at 57 and a downwardly extending arm 58 terminating in the suction foot 36.

A pair of cams 59 and 60 on the rotating shaft 61 engage suitable rollers on the arms 58 and 56 respectively. The shaft 61 may be driven by any suitable means, such for instance, as a sprocket chain (not shown), from shaft 47 or 50. In operating the lifter and puller, the cam 60 will move out from under its roller and lower the foot into position and immediately thereafter the cam 59 will move away from its roller and spring 62 will pull the upper insert forward under the roller 35. I have illustrated suitable gears 63, 64, 65 and 66 for driving the paste roll 20 and the paste blade 21 from the main countershaft 47. A suction tube 67 with suitable ports may be used to deliver suction to the ducts 30 during rotation through the arc indicated by the arrow 68.

Devices according to my invention can turn out assembled units at a much higher speed than the intermittently acting machines of the prior art, and they will not stick or clog up or fail to locate the tips or inserts with the desired precision on the signatures.

While I have shown and described in detail a specific embodiment of my invention, it should be clearly understood that the description is only for purposes of illustration, that devices according to my invention may be used for handling a large variety of materials other than those referred to and that many variations and modifications will naturally occur to those skilled in the art. I aim in the subjoined claims to cover all such legitimate modifications and variations.

I claim as my invention:

1. A tipping machine having, in combination, two continuously rotating synchronously operated carriers, stops adjacent said carriers located in corresponding positions adapted to hold sheet-like pieces of material in corresponding positions, grippers mounted on said carriers adapted to grip said pieces of material and cam actuated means for simultaneously removing said stops to enable said grippers to clamp a pair of articles to said carriers in registering positions.

2. A tipping machine having, in combination, two continuously rotating carriers, automatic stop mechanisms associated therewith and adapted to hold a piece of material in position, cam actuated grippers on each carrier adapted to take a piece of material from said stop mechanism and hold it on said carrier through a predetermined portion of a revolution, said grippers on one

of said carriers being arranged to release the piece of material thereon before the opposed pieces of material on said carriers are pressed together and suction means on said carrier for holding said piece of material in position on said carrier while said pieces of material are being pressed together.

3. A tipping machine having, in combination, two continuously rotating carriers, cam-actuated grippers on each carrier adapted to grip a piece of material and hold it on said carrier through a predetermined portion of a revolution, an automatic stop mechanism associated with each carrier adapted to hold a piece of material in position to be engaged by said grippers, and feeding means for delivering pieces of material to said stop mechanism, said carrier, stop mechanism and feeding means having cam-actuated connections therebetween for synchronous operation thereof.

4. A tipping machine having, in combination, two continuously rotating carriers mounted on parallel axes, a plurality of cam-actuated grippers on each carrier adapted to grip a piece of material and hold it on said carrier during a predetermined portion of a revolution, one of said carriers having suction means arranged to supplant the action of said gripper.

5. A tipping machine having, in combination, a continuously rotating carrier, a plurality of gripping means on said carrier, each means adapted to grip a piece of material and hold it on said carrier during a predetermined portion of a revolution, said gripping means being spaced about the periphery of said carrier whereby a single rotation of said carrier will handle a plurality of pieces of material, a second continuously rotating carrier synchronized with said first mentioned carrier and adapted to carry pieces of sheet-like material down into registering relation with the pieces of material carried by said first mentioned carrier, automatic stop mechanism connected with said carriers for synchronous operation and adapted to hold the sheets of material in registering position and release them as they are gripped on said carriers, automatic feeding mechanism including synchronously operated feet and a pusher arm for delivering thick pieces of sheet-like material to one of said carriers, an automatic feeding mechanism comprising a continuously rotating friction element, and an automatic lifter and puller, for feeding relatively thin pieces of sheet-like material to said other carrier.

In testimony whereof, I have hereunto affixed my signature.

ERNST R. RICHARDS.