Dec. 16, 1941. B. S. DAVIS 2,266,171

MACHINE AND METHOD OF ASSEMBLING AND SECURING TOGETHER SHEETS OF PAPER IN TABLET FORM

Filed June 17, 1940 2 Sheets-Sheet 1

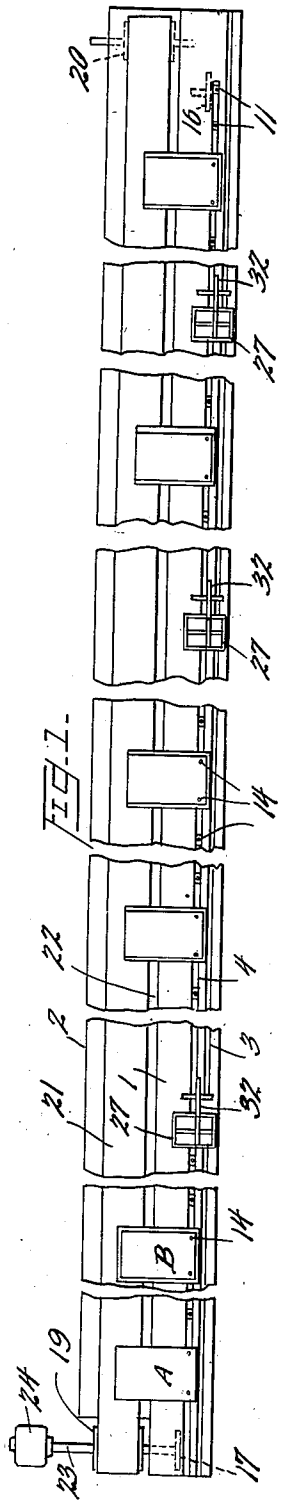


FIG. 1.

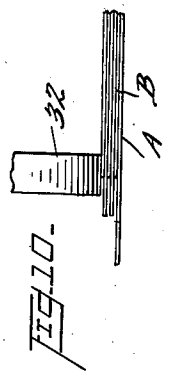


FIG. 10.

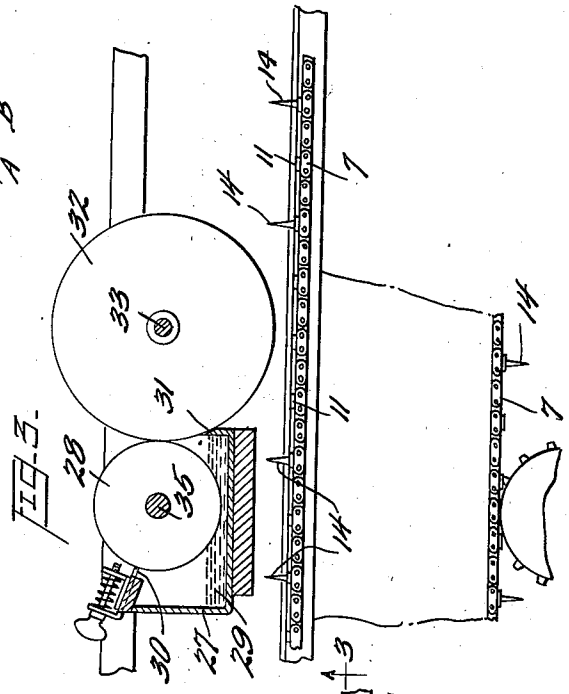


FIG. 5.

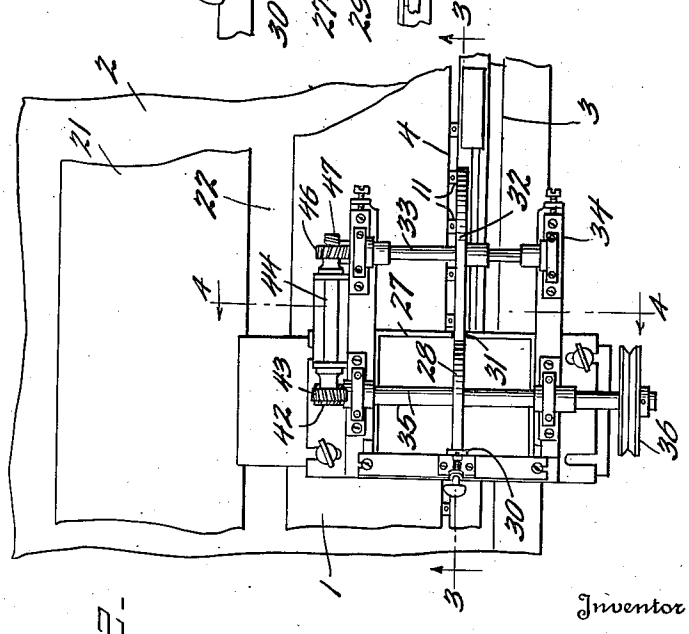


FIG. 2.

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FIG. 4.

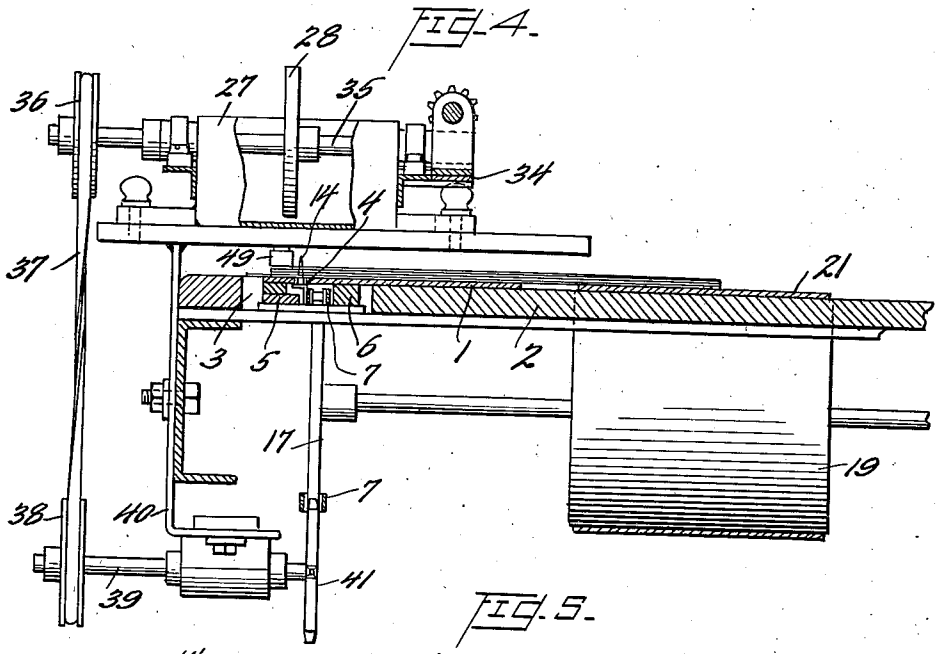


FIG. 5.

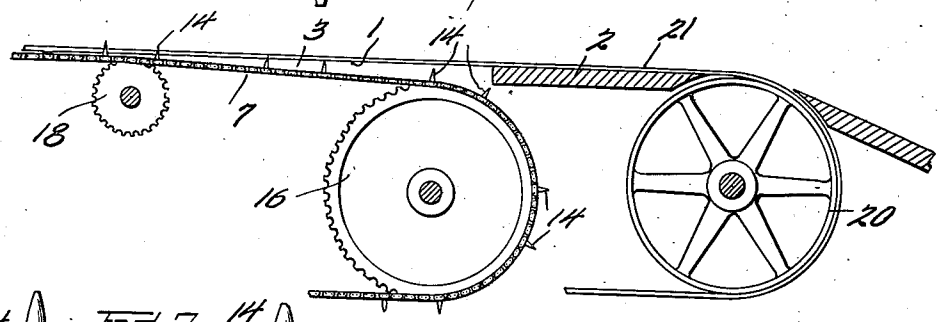


FIG. 7.

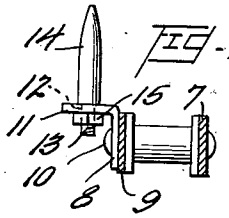


FIG. 6.

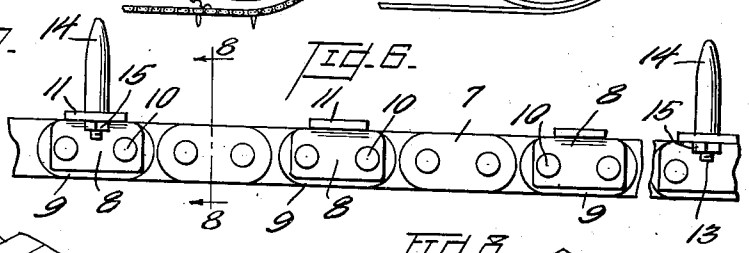


FIG. 9.

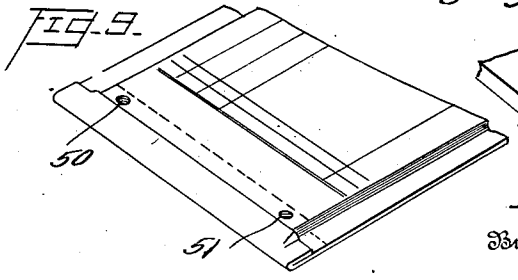
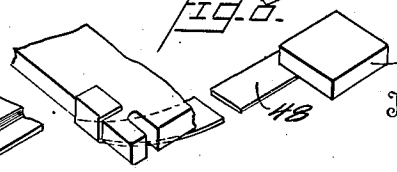


FIG. 8.



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MACHINE AND METHOD OF ASSEMBLING AND SECURING TOGETHER SHEETS OF PAPER IN TABLET FORM

Benjamin S. Davis, Newport News, Va.

Application June 17, 1940, Serial No. 341,067

17 Claims. (Cl. 270—32)

My invention relates to improvements in a machine and method of assembling and securing together sheets of paper in tablet form.

The object of my invention is to provide a machine and method, in which sheets of paper of different widths may be more quickly and accurately assembled together and fastened in their proper relative positions to form a composite tablet.

Another object of my invention is to provide a machine of this character, in which the sheets of carbon paper may be more readily assembled between the record sheets in their proper position and held therein during the step of securing the sheets together.

A further object of my invention is to provide the assembling of a tablet, in which the sheet of carbon paper is placed between two record sheets and the sheet of carbon paper and one record sheet secured to the tablet by a single operation.

A still further object of my invention is to provide a machine of this character which is simple in construction and operation, and in which sheets of different widths may be accurately assembled and secured together by inexperienced operators.

In the accompanying drawings

Figure 1 is a diagrammatical view of my improved machine, showing the different steps in the assembly of the tablet produced thereby;

Figure 2 is an enlarged top plan view of a portion of the machine showing the arrangement of the pin carrying chain, the stationary section, the belt conveyor and the glue applying means;

Figure 3 is a vertical sectional view taken on the line 3—3 of Figure 2;

Figure 4 is an enlarged transverse sectional view, taken on the line 4—4 of Figure 2;

Figure 5 is an enlarged vertical sectional view of the discharge end of the machine;

Figure 6 is an enlarged side elevation of the pin carrying chain;

Figure 7 is a transverse sectional view taken on the line 8—8 of Figure 6;

Figure 8 is a perspective view of the pressure member for forcing the sheets together after the glue has been applied;

Figure 9 is a perspective view of the completed tablet, showing the lower end partly broken away; and

Figure 10 is an elevational view of the glue applying roller resting on the tablet.

In the manufacture of tablets formed of sheets of different widths, it has been very difficult to assemble the same with the sheets in accurate alinement. This has heretofore been done by hand, requiring very skilled operators to accurately aline the sheets. In my improved machine the sheets can be very rapidly and accurately assembled with their side edges in proper relation to each other without the use of skilled operators.

Referring now to the drawings, 1 represents an elongated stationary table which is of considerable length, so that the operators may stand side by side, requiring one operator for each sheet of the tablet being assembled. The table is preferably made of metal and mounted upon a wooden frame 2, which is of a width considerably greater than the metal table 1, as will be hereinafter more fully set forth. The frame 2, adjacent the outer edge of the table, is cut away, as indicated at 3, below the outer edge of the metal table 1. The table 1, adjacent its outer edge, is provided with a longitudinal slot 4 which extends the entire length of the machine. Below the slot 4 is arranged two guide frames 5 and 6, between which travels an endless chain which is arranged slightly below the lower face of the table 1. Secured to the side walls of the chain 7 are L-shaped plates 8, which are comparatively close together; in fact, every other link 9 of the chain 7 has a plate 8 secured thereto by the same rivets 10, which connect the links of the chain, as clearly shown in Figures 6 and 7 of the drawings. The horizontal portion 11 of the plates 8 is provided with openings 12, through which pass the reduced shank 13 of the pins 14. The shanks 13 are screw threaded and upon which are threaded the nuts 15, by means of which the pins are clamped to the plates in a vertical position, as clearly shown in Figure 7 of the drawings. By this structure, it will be seen that the pins can be removed and placed in any of the plates 8, so that they will be different distances apart, according to the character of work performed. As shown in Figure 4 of the drawings, the horizontal portion 10 of the plate 8 extends below the slot 4, and, therefore, the pin 14 will extend through the slot 4 and free to travel longitudinally therein.

Carried by each end of the table is a sprocket 16 and 17, over which the chain 7 passes. These sprockets, as shown in Figure 5 of the drawings, have their outer peripheries below the lower face of the metal table 1, so that the pins are gradually drawn downwardly below the lower face of the table to withdraw them from the openings in the tablet just formed, as will be hereinafter more fully described. Adjacent the sprockets 16 and 17 are small sprockets 18, which hold the

chain in a position with the pins extending through the slot 4. From these sprockets 18, the chain 7 gradually travels downwardly to withdraw the pins, as fully shown in Figure 5 of the drawings.

At each end of the table, at the inner edge thereof, are arranged pulleys 19 and 20, over which passes the fabric belt 21. This belt is of the entire length of the table and travels upon the frame 2, as clearly shown in Figure 4 of the drawings. As shown in Figure 4 of the drawings, the outer edge of the belt 21 is spaced a slight distance from the table 1, leaving a space 22. The shaft 23, of the pulley 19, extends outwardly through the support of the frame 2, and is connected to a motor 24, within the housing 25. The motor is supplied with power through the cable 26 and is controlled by any form of switch. Mounted on the shaft 23 is the sprocket 16, which is of the same diameter as the pulley 19, whereby the sprocket chain 7 and the belt 21 travel at the same speed, which is essential, as will be later described.

Arranged at proper intervals on the table 1 are the glue applying mechanisms, which will now be described. The glue applying means comprise an open tank 27, having arranged therein a roller 28, which has its lower end travelling in the glue 29, arranged in the bottom of the tank 27. In order to insure the proper amount of glue being supplied to the sheets of paper, I provide a spring pressed scraper or wiper 30, as shown in Figure 3 of the drawings. One wall of the tank 27 is cut away, as indicated at 31, and into which extends the glue applying roller 32, which engages the periphery of the roller 28 and receives the proper amount of glue. The roller 32 is mounted on the shaft 33, which is journalled in the frame 34, carried by the side wall of the tank 27. The shaft 35, of the roller 28, extends through the wall of the tank and is provided with a pulley 36, over which passes the twisted belt 37, which in turn passes around a pulley 38, mounted on the shaft 39. This shaft 39 is mounted on a frame 40, carried by the table. This shaft, as shown in Figure 4 of the drawings, is below the lower flight of the chain 7. The shaft 39, directly below the chain 7, is provided with a sprocket 41, which engages the chain, and whereby the sprocket is driven for rotating the shaft 35, through the medium of the pulleys 36 and 38 and the twisted belt 37. The inner end of the shaft 35 is provided with a worm gear 42, meshing with a worm 43, carried by the shaft 44. The opposite end of the shaft 44 is provided with a worm 46, meshing with a worm 47, carried by the shaft 33, which, as heretofore stated, carried the glue applying roller 32. This glue applying roller, as shown in Figures 2 and 4 of the drawings, is in a vertical line just beyond the slot 4, through which the pins 14 of the chain pass.

In order to press the sheets down upon the previously placed sheet, to cause the glue to properly adhere, I provide a spring arm 48, carrying a block 49, the said block being in a direct line with the glue applying roller 32.

In assembling sheets in this machine, it is necessary that each sheet be provided with two openings 50 and 51, as shown in Figure 9 of the drawings. These openings are preferably spaced a short distance from the edge of the sheets, although they could be arranged in a different manner without departing from the spirit of my invention, as these openings would be governed by the character of the tablet to be assembled on the machine.

In operation, the motor is started causing the belt 21 and the chain 7 to travel at the same rate of speed and an operator stands at the left of the machine and places a ledger sheet A over two pins, carried by the chain. The sheet is held at an angle until the same is properly placed over the pins and is then released and falls on the belt 21. It then travels very slowly to the next operator who places a sheet of carbon B over the two pins conveying the ledger sheet across the table. The holes in the carbon paper are so arranged that the upper edge of the carbon paper will be slightly below the upper edge of the ledger sheet. During these operations the sheets are traveling very slowly across the table. The sheets then pass under the glue applying roller 32. This roller is so positioned that a small ribbon of glue is placed upon the ledger sheet, above the carbon sheet, and a small ribbon of glue is also placed across the upper edge of the carbon paper. After passing from under the glue applying roller, a third operator places a record sheet on top of the sheet of carbon paper and positions the same by the openings therein. The sheets then continue to travel and the next operator places a sheet of carbon paper on the record sheet, in the same position as the first sheet of carbon paper, which has to be absolutely accurate because of the openings therein. The sheets continue across the machine and a second roller applies glue to the upper end of the first record sheet and the upper end of the second carbon sheet. The pressure of this roller causes the first record sheet to adhere to the upper end of the ledger sheet and also causes the upper end of the first carbon sheet to adhere to the lower face of the first record sheet. A second record sheet is then placed on the second carbon sheet and the operation repeated, causing the sheets to adhere, as before described. This operation can be repeated to build up a tablet of any desired number of record sheets. After the desired number of sheets have been placed upon each other to form the required tablet, the upper edge of the ledger sheet is folded over on the scored line 53 and glued to the top record sheet. After this operation, the tablet passes under the pressure block 49 to insure the proper sealing of all the sheets.

Having thus described my invention, what I claim is:

1. A machine of the character described, comprising a table, a chain travelling longitudinally thereof below the upper face thereof, pins carried by the chain and extending above the upper face of the table and arranged in sets in spaced relation.

2. A machine of the character described, comprising a table, a chain travelling longitudinally thereof, pins carried by the chain and extending above the upper face of the table and arranged in sets in spaced relation, and a glue applying means carried by the table and so positioned to apply glue after two sheets have been placed over a set of pins.

3. A machine of the character described, comprising a table having a slot extending longitudinally thereof, a travelling chain below the slot, pins carried by the chain and extending through the slot above the table and arranged in sets in spaced relation, and a glue applying means carried by the table and so positioned to apply glue to the upper ends of two sheets

after they have been placed over a set of pins.

4. A machine of the character described, comprising a table having a slot extending longitudinally thereof, a travelling chain below the slot, pins carried by the chain and extending through the slot above the table and arranged in sets in spaced relation, a travelling belt in rear of the slot and the table and having a stationary section between the same and the slot.

5. A machine of the character described, comprising a table having a slot extending longitudinally thereof, a travelling chain below the slot, pins carried by the chain and extending through the slot above the table and arranged in sets in spaced relation, a travelling belt in rear of the slot and having a space between the same and the table, and a glue applying means carried by the table and so positioned to apply glue to two sheets after they have been placed one above the other over a set of pins.

6. A machine of the character described, comprising a table, a chain travelling longitudinally of the table, pins carried by the chain and arranged in spaced relation.

7. A machine of the character described, comprising a table, a chain travelling longitudinally thereof adjacent the front edge, pins carried by the chain and arranged in sets in spaced relation, and a travelling belt at the rear end of the table, and means for driving the belt and chain at the same speed.

8. A machine of the character described, comprising a table, a chain travelling longitudinally thereof adjacent the front edge, pins carried by the chain and arranged in sets in spaced relation, a travelling belt in rear of the table, a glue applying means in front of the chain to apply glue after two sheets have been placed over a set of pins, and means for driving the belt and the chain at the same speed.

9. A machine of the character described, comprising a table, a chain travelling longitudinally thereof adjacent the front edge, pins carried by the chain and arranged in sets in spaced relation, a belt travelling parallel with the chain in rear of the table, means for driving the belt and the chain at the same rate of speed, a glue applying means in front of the chain to apply glue after two sheets have been placed over a set of pins, and means operated by the chain for operating said glue applying means.

10. A machine of the character described, comprising a table having a slot extending longitudinally thereof, a chain below said slot, pins carried by the chain and arranged in sets in spaced relation and extending through the slot, a travelling belt in rear of the table, means for driving the belt and the chain at the same speed, a glue applying means in front of the chain to apply glue to two sheets after they have been placed over a set of pins, and means driven by the chain for operating said glue applying means.

11. A machine of the character described, comprising a table having a slot extending longitudinally thereof, a chain below the slot, pins carried by the chain and arranged in sets in spaced relation, a belt travelling parallel with the chain and forming the upper face of the rear portion of the table, means for driving the belt and the chain at the same speed, a glue applying means in front of the chain to apply glue to the upper edges of two sheets after they have been placed over the pins, means operated by the chain for operating the glue applying means.

12. A machine of the character described, comprising a table, a chain extending longitudinally thereof below the front edge of the table, pins carried by the chain and arranged in sets in spaced relation and extending above the table, a belt travelling parallel with the chain and forming the upper face of the rear portion of the table, means for driving the belt and the chain at the same speed, glue applying means in rear of the chain at predetermined points to apply glue to the upper edges of two sheets after they have been placed over the pins, and means operated by the lower flight of the chain for operating the glue applying means.

13. A machine of the character described, comprising a table having a central longitudinal portion, a chain travelling below the central portion of the table in front thereof, pins carried by the chain and arranged in sets in spaced relation and extending above the central portion of the table, a broad flat belt travelling parallel with the chain in rear of the central portion of the table and forming a continuation thereof, means for driving the belt and the chain at the same speed, glue applying means in rear of the chain and arranged at predetermined distances apart for applying glue to the upper edges of two sheets after they have been placed over the pins, and means operated by the chain for operating the glue applying means.

14. A machine of the character described, comprising a table having a central longitudinal rigid portion, a chain below the front edge of the solid portion of the central rigid portion of the table, pins carried by the chain and arranged in sets in spaced relation and extending above the central rigid portion of the table, a belt travelling parallel with the chain at the rear of the central rigid portion of the table and in a plane therewith, means for driving the belt and the chain at the same speed, a glue applying means in front of the chain and arranged at predetermined distances apart to apply glue to the upper edges of two sheets after they have been placed over the pins, and means operated by the chain for operating the glue applying means.

15. A method of forming manifold tablets, consisting in first placing a record sheet having spaced openings over travelling correspondingly spaced pins, placing a sheet of carbon paper having spaced openings over the pins on top of the record sheet, applying cement to the upper edges of the record sheet and the carbon sheet, placing a second record sheet having openings over the pins on top of the carbon sheet and over the upper edge of the first mentioned record sheet.

16. A method of forming manifold tablets, consisting in first placing a record sheet having spaced openings over travelling correspondingly spaced pins, placing a sheet of carbon paper having spaced openings over the travelling pins on top of the record sheet with the record sheet extending slightly beyond the upper end of the carbon sheet, applying cement to the upper edges of the record sheet and the carbon sheet in a narrow ribbon-like form, placing a second record sheet having openings over the pins on top of the carbon sheet with its upper edge extending over the ribbon-like form of cement on the upper edges of the record sheet and the carbon sheet for cementing the lower face of the second record sheet to the upper faces of the first record sheet and carbon sheet.

17. The method of forming manifolding tablets, consisting in first placing a record sheet having spaced openings over correspondingly spaced pins carried by a travelling chain, placing a sheet of carbon paper having correspondingly arranged openings over said travelling pins with its upper edge below the upper edge of the record sheet, applying a ribbon-like band of cement on the upper edge of the record sheet and the carbon sheet in its travel with the chain, placing a second record sheet having spaced openings over said pins in the travel thereof, cementing the second record sheet to the upper edge of the first record sheet and the carbon sheet, and repeating the operation at different points of travel of the chain for making a tablet of the desired number of sheets.

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