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3,005,484

MACHINES FOR APPLYING REINFORCING CORDS TO THE EDGES OF A WEB

Filed June 5, 1959

2 Sheets-Sheet 1

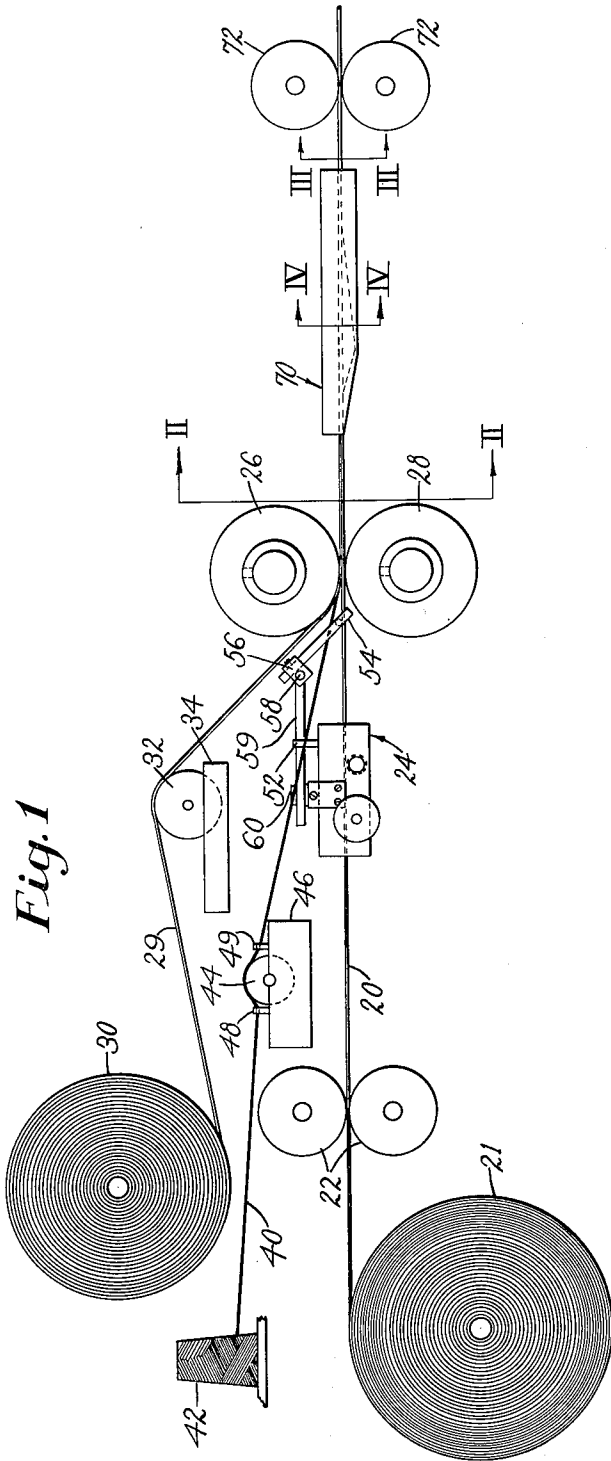


Fig. 1

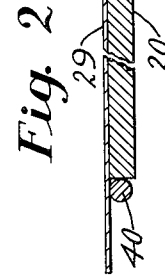
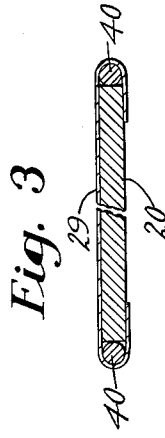


Fig. 2

Fig. 3

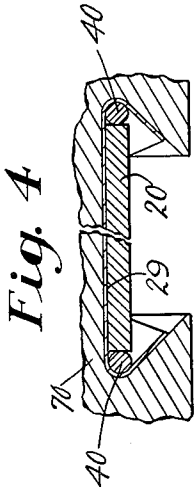


Fig. 4

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2 Sheets-Sheet 2

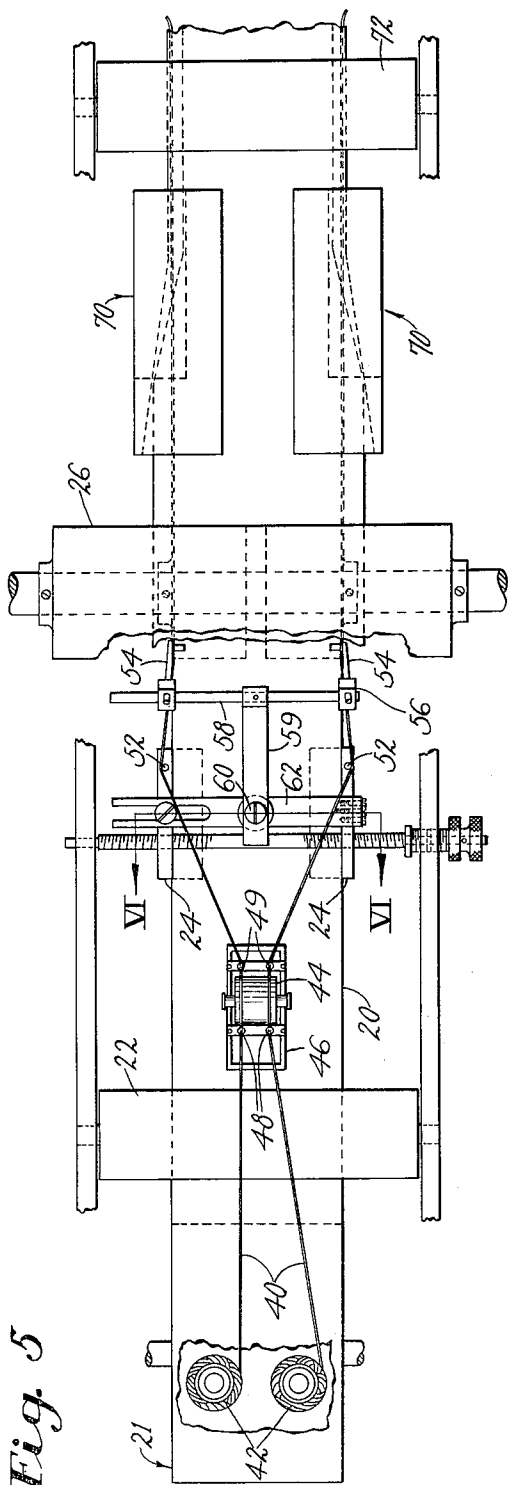


Fig. 5

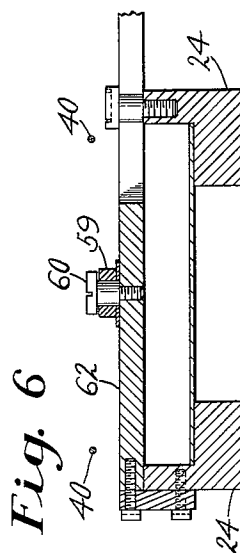


Fig. 6

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MACHINES FOR APPLYING REINFORCING CORDS TO THE EDGES OF A WEB

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2 Claims. (Cl. 156—438)

This invention relates to a machine for reinforcing pasteboard webs and more particularly to machines for applying reinforcing cords to webs from which box or carton blanks may be made.

Certain types of boxes, such as shoe boxes, are used repeatedly, and their edges in particular are subjected to considerable strain by store clerks and the like. To prevent tearing of the boxes and/or the covers at these locations subject to greatest strain, it is the practice to reinforce the boxes in these locations, and to provide for maximum strength, the reinforcement must be effective at the very edge of the box or cover.

Recognizing this fact there have been many attempts to reinforce such boxes by applying reinforcing cord to the edges of the pasteboard webs from which the box blanks are to be cut. According to normal practice the pasteboard webs are covered on one side with a web of cover paper wider than the pasteboard web. The excess of cover material is thereafter folded about the edges of the web so that the boxes formed therefrom will have finished edges. Methods of reinforcement generally in use contemplate the placement of reinforcing cords at the edges of the web before the cover paper is folded thereover. However, it has been extremely difficult to maintain the cord at the very edges of the web while the cover paper is folded. One method proposed includes the step of slitting the edges of the web to retain the cord in place while the cover is folded. This method requires that the web be guided with extreme accuracy both for slitting the edges and for placing the reinforcing cords in the slits. This has led to the use of guides which must maintain close tolerances with the edges of the web and since paper is extremely abrasive the guides are exposed to excessive wear. Thus the guides must be constantly adjusted to maintain close tolerances.

Accordingly, it is an object of the present invention to avoid the above complexities and to provide a machine for applying reinforcing cords to the opposite edges of the paste board web simultaneously with the application of a cover paper thereto. To this end the pasteboard web is fed between a pair of opposed pressure rolls along a plane generally normal to the bite of the rolls. The web of cover paper is also fed to the bite of the rolls but along a plane converging with the first plane at the rolls so that the paper web is wrapped around a portion of one of the pressure rolls. The reinforcing cords are fed along a plane between the pasteboard web and the paper web so that the cords contact the cover paper before engaging the edges of the pasteboard web. The cords are guided into alignment with the edges of the pasteboard web by cord guiding members which engage the edges of the pasteboard web at points in advance of but closely adjacent the bite of the rolls. According to a preferred embodiment of the invention, the guide members are mounted for unitary lateral movements for following the edges of the web regardless of its lateral displacement. Since the paper web and the reinforcing cords are both coated with adhesive there is no tendency for the cords to be displaced while the cover paper is folded around the cord and the edges of the web.

The above and other features of the invention, including various details of construction and novel combina-

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tions of parts will now be described with reference to the drawings and pointed out in the claims.

In the drawings,

FIG. 1 is a side elevation diagrammatically illustrating one form of machine incorporating the present invention;

FIG. 2 is a section along the line II—II of FIG. 1;

FIG. 3 is a section along the line III—III of FIG. 1;

FIG. 4 is a section along the line IV—IV of FIG. 1;

FIG. 5 is a plan view of the machine; and

FIG. 6 is a section along the line VI—VI of FIG. 5.

As illustrated in FIGS. 1 and 5, a web of pasteboard 20 is fed from a supply roll 21 by a pair of feed rolls 22. After passing through the feed rolls the web is fed between adjustable edge guides 24 which prevent any appreciable lateral movement of the web. The web thereafter passes between pressure or combining rolls 26 and 28. For covering the pasteboard web a web of cover paper 29 is fed from a supply roll 30 and over an adhesive applying roll 32 which is coated with adhesive from a tray 34. The paper web thereafter passes between the combining rolls 26 and 28 to be applied to the web 20. As seen in FIG. 1, the pasteboard web 20 is fed along a plane substantially normal to the bite of the combining rolls. The cover paper is fed from a point spaced above the pasteboard web along a path forming an angle with the path of the pasteboard web so that the paper is wrapped around a portion of the upper combining roll 26.

Reinforcing cords 40 to be applied to the edges of the web 20 are fed from supply rolls 42 and over an adhesive applying roll 44 which is coated with suitable adhesive from a tray 46. At both sides of the roll 44 the cords are wrapped one or more times about friction posts 48 and 49 so that the cords are under substantial tension when passing over the roll 44 and while being guided into engagement with the webs 20 and 29. The cords are then directed from the posts 49 to the bite of the rolls 26 and 28 between the feed paths of the pasteboard web 20 and the paper web 29. As seen in FIG. 1, the converging angle of the path of the cords causes the cords to contact the cover paper before engaging the edges of the web 20.

Referring to FIG. 5, it may be seen that the cords are directed from points spaced laterally from the edges of the pasteboard web by posts 52. Also before contacting the cover paper, the cords are first aligned precisely with the edges of the pasteboard web by guide members 54 which are carried by blocks 56 adjustably fixed to a transverse rod 58. The blocks 56 are secured to the rod by setscrews (not shown) so that the spacing of the guide members 54 may be adjusted along the rod 58 to accommodate pasteboard webs of different widths. The rod is carried at one end of a bar 59 which is pivotally mounted at its opposite end by a shoulder screw 60 fixed in a cross bar 62 secured to the edge guides 24. Thus it may be seen that the cord guides 54 are capable of closely following the edges of the pasteboard web regardless of any lateral displacement of the web. The cords 40 are directed from the posts 52 by the inner sides of the cord guide members 54 into precise and continuous alignment with the pasteboard web 20.

Due to the arrangement of the covering feed paths it may be seen that the cords are first applied to the cover paper while in precise alignment with the edges of the pasteboard web. Since the cords are under substantial tension and since both the cords and the cover paper are coated with adhesive, the cords are thus caused to adhere firmly to the cover paper while in precise alignment with the edges of the pasteboard web. As the cover paper, cords and pasteboard web are fed between the

combining rolls 26 and 28, the cover paper 29 is applied to one side of the pasteboard web 20 while the cords 40 are wiped down into precise engagement with its edges. Referring to FIG. 2, the relative positions of the cover paper, cords and the pasteboard web may be seen as they appear after being combined by the combining rolls. Since the web of cover paper 29 is of greater width than the pasteboard web, the paper extends beyond the edges of the pasteboard to form ledges against which the cords 40 are retained, the adhesive coating on the cords also causing the cords to adhere to the edges of the pasteboard web. With the cords held under substantial tension against both the cover paper and the edge of the pasteboard web there is no tendency for the cords to be displaced.

In the condition illustrated in FIG. 2, the combined webs and reinforcing cords are fed to folding guides 70 (also seen in FIG. 4) which fold the cover paper around the reinforcing cords 40 and against the under surface of the pasteboard web to the condition illustrated in FIG. 3. The assembly is then fed between a pair of pressure rolls 72 to insure that the cover paper is firmly adhered to both sides of the pasteboard web.

Thus it may be seen from the foregoing and by reference to FIG. 3, that the reinforcing cords 40 are precisely aligned with and firmly secured to the edges of the pasteboard web 20 so that when box blanks are cut from the web the edges of the boxes formed therefrom are firmly reinforced.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a machine for making a reinforced composite web, a pair of opposed pressure rolls between which a first web and a second web are fed from converging paths,

the second web being of greater width and adhesively coated on the surface engaging the first web, means for guiding a pair of reinforcing cords between said converging paths into engagement with the coated surface of the second web and thereafter into engagement with the edges of the first web, said guiding means including members guiding said cords and having portions engaging the opposite edges of the first web for precisely aligning the cords with said edges when the cords engage the coated surface of the second web, and means for folding the margins of the second web around the cords and the edges of the first web after passing through said rolls.

2. In a machine for making a reinforced web, a pair of opposed pressure rolls between which a first web and a second web are fed from converging paths, the second web being of greater width and adhesively coated on the surface engaging the first web, means for guiding a pair of reinforcing cords between said converging paths into engagement with the coated surface of the second web and thereafter into engagement with the edges of the first web, said guiding means including members guiding said cords and having portions engaging the opposite edges of the first web for precisely aligning the cords with said edges when the cords engage the coated surface of the second web, and means mounting said members for unitary lateral movements for following lateral displacement of the first web.

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