United States Patent [19]

Borski

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[54] **MACHINE FOR MAKING FILE FOLDERS**

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[52] **U.S. Cl.** ..... **93/1 E,** 93/13, 93/36 MM, 118/32, 118/411

[51] **Int. Cl.** **B31b 1/62,** B31b 41/60

[58] **Field of Search** .... 93/1 E, 1 F, 13, 27, 36 MM, 93/56 PD, 61 R, 62; 156/442.1, 443, 479; 270/93; 118/32, 410, 411, 412

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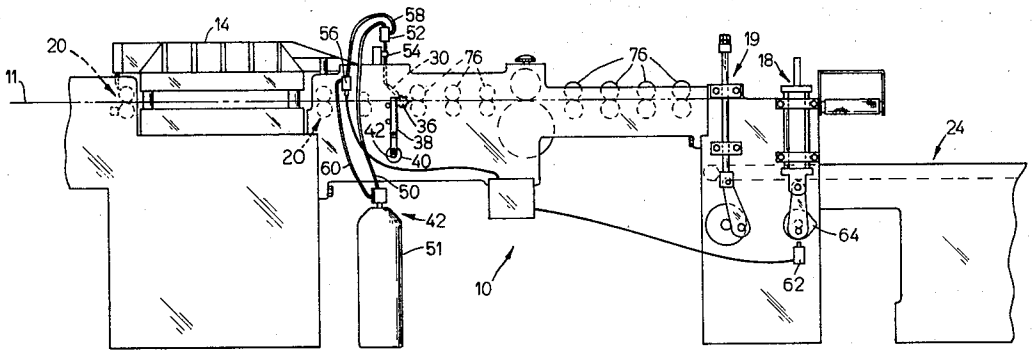
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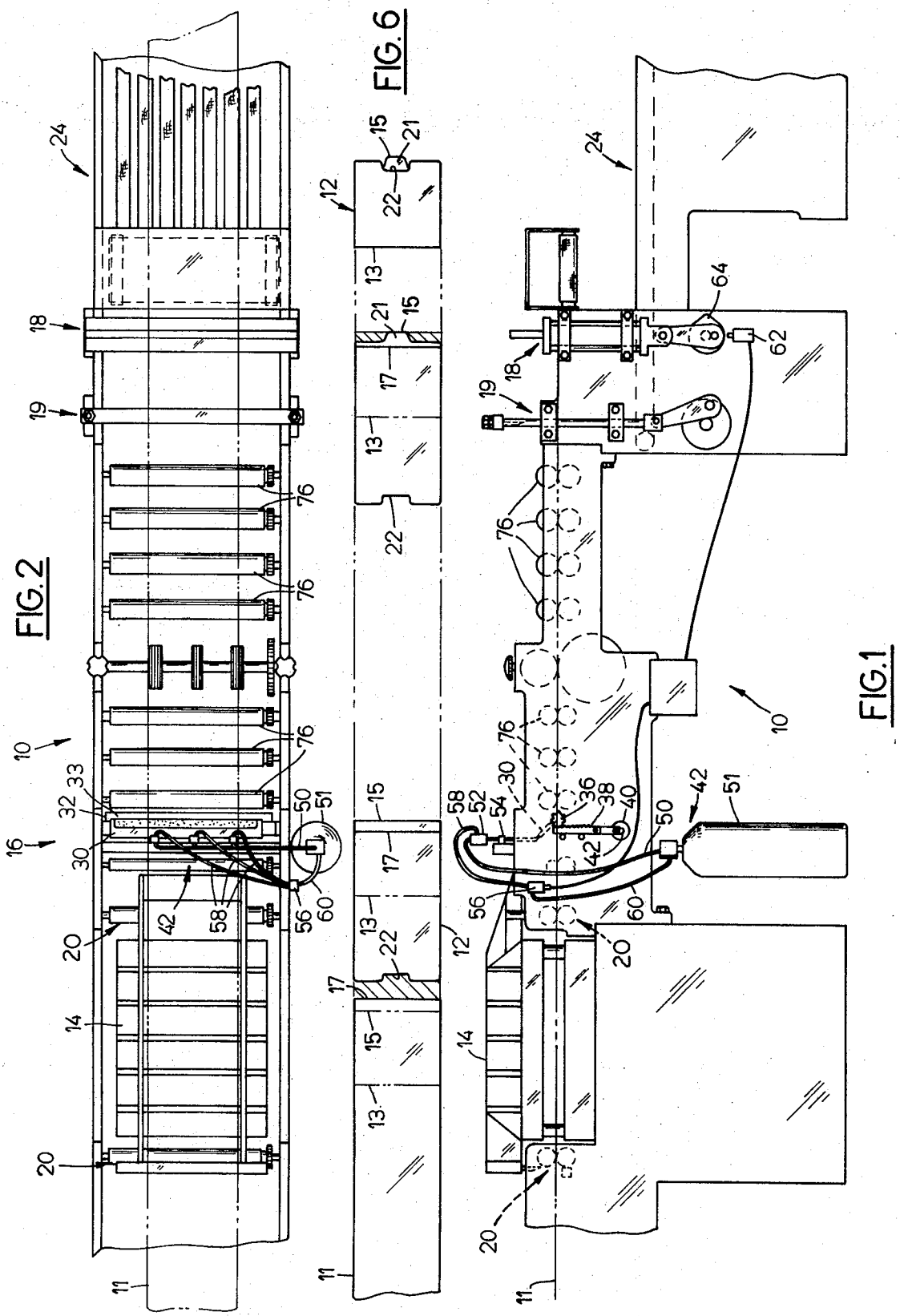
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[57] **ABSTRACT**

A machine for making file folders having a double reinforced tab, the machine includes a conveyor for conveying file folder blanks along a longitudinal path in a step-by-step manner, a cutting and scoring die for cutting and scoring the blanks, a glue applying apparatus including a blade located at an acute angle to the direction of travel of the blanks, a folding roller for pressing the leading edge of the blank against the glue applying blade and a pneumatic glue metering system for simultaneously metering glue to the blade as the leading edge is pressed against the blade, a set of rollers for pressing the folded leading edge against the file folder blank, a cutting die for cutting the double folded leading edge to form the tab and a folding mechanism for folding the file folder.

9 Claims, 6 Drawing Figures




FIG. 2
FIG. 6
FIG. 1

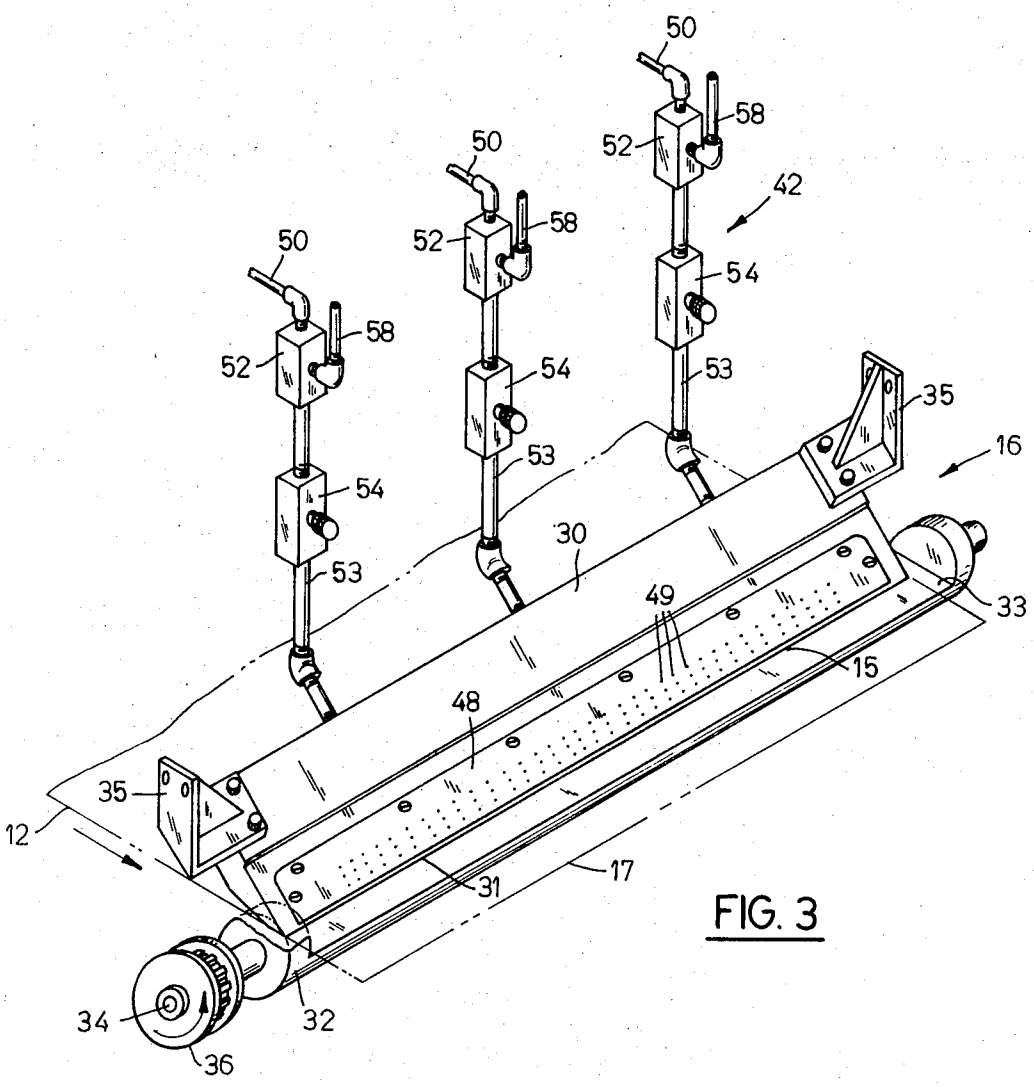


FIG. 3

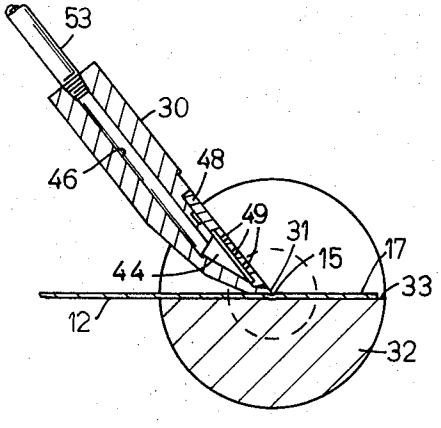


FIG. 4

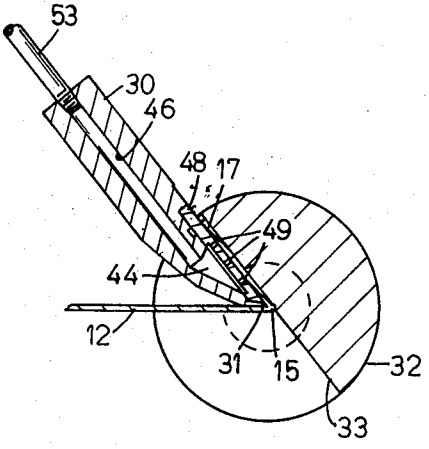


FIG. 5

MACHINE FOR MAKING FILE FOLDERS

BACKGROUND OF THE INVENTION

File folders conventionally are formed by conveying the folders in succession along a longitudinal path through a cutting and scoring die, a gluing apparatus and a tab cutting die. In order to produce the double tab on the leading edge of the die, various devices have been devised for applying the glue and folding the leading edge to form the tab. These devices have for the most part, been objectionable because of the inability to control the amount of glue and the resultant fouling of the equipment due to the excessive and uneven distribution of glue.

SUMMARY OF THE INVENTION

The file folding machine of the present invention is provided with a glue applying apparatus which accurately meters the glue and applies the glue only to the inside surface of the leading edge which is folded and cut to form the double reinforced tab. The glue applying apparatus includes a blade disposed between the cutting and scoring die and the tab cutting die to fold and apply glue to the leading edge of the file folder. With this arrangement, the folding and gluing step can be performed simultaneously with the operation of the two cutting dies.

DRAWINGS

FIG. 1 is a side view in elevation showing the general arrangement of the machine for forming a double top tab file folder;

FIG. 2 is a top plan view of the machine showing the location of the glue applying apparatus;

FIG. 3 is a perspective view of the glue applying apparatus and the tab folding roller on an enlarged scale;

FIG. 4 is a side view in section of the glue applying blade showing the neutral position of the tab folding roller on a further enlarged scale;

FIG. 5 is a view similar to FIG. 4 showing the tab folding roller in the operative position; and

FIG. 6 is a schematic view of the file folders shown at the cutting and forming, gluing and tab forming positions.

DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 and 2 of the drawings, the file folding machine **10** which is used to form the double top tab file folders **12** includes a cutting and scoring die **14**, a glue applying apparatus **16**, a tab cutting die **18** and a file folding mechanism **19**. A web of paper board **11** is conveyed in a step-by-step manner through the machine in a longitudinal path which includes in succession the die **14**, the gluing apparatus **16**, a file folding mechanism **19** and the tab cutting die **18** by means of roller drive assemblies **20**. The web **11** is advanced in a step-by-step manner and in each step of advance, the cutting and scoring die **14**, glue applying apparatus **16**, and tab cutting die **18** are simultaneously actuated to perform their respective cutting, scoring and gluing functions. The file folders **12** are folded by means of the folding mechanism **19** and deposited on a discharge belt conveyor **24** at the end of the machine **10**.

The cutting and scoring die **14**, tab cutting die **18**, folding mechanism **19** and conveying system **20** and **24** all operate in a well known manner. In this regard, the cutting and scoring die **14** (FIG. 6) is closed each time the web stops to cut the outer periphery of the file folder blank and to impress score lines **13** and **15** into the blank and to cut the lead edge **17** and notches trailing edge **22**. The tab cutting die **18** is used to cut the lead edge **17** of the blank to form the tab **21**. The folding mechanism **19** is used to fold the file blank on score line **13** and to feed the file folder **12** to conveyor **24**.

GLUE APPLYING APPARATUS

In accordance with the invention, the leading edge **17** of the file folder blanks are folded and glued by means of the glue applying apparatus **16**. In this regard and referring to FIGS. **3, 4** and **5**, the apparatus **16** includes a blade **30** supported by brackets **35** on the machine **10** at an acute angle with respect to the direction of travel of the file folder blanks **12**. A folding bar **32** having a flat surface **33** and a drive extension **34** is mounted on the machine **10** to enable pivotal motion of bar **32** so that the surface **33** on the bar **32** rotates or pivots about the lower edge **31** of the blade **30**. The bar **32** is rotated by means of a pinion gear **36** provided on the end of the extension **34** and a rack **38** connected to an eccentric cam **40**. The cam **40** is mounted on a shaft **42** which is journalled for rotation in machine **10** and driven in timed sequence with the roller drive assemblies **20**. Each time the drive assemblies **20** stop, the rack **38** is moved through a complete cycle rotating the surface **33** on the roller **32** against the front surface of blade **30** and returning the bar **32** to its original position.

Glue is applied to the inside surface of the leading edge **17** of the file folder blank by means of a glue applying apparatus **42** operatively connected to the blade **30**. In this regard, the blade **30** is provided in the front surface with a recess **44** and a number of inlet passages **46**. A perforate plate **48** covers the recess **44** and is provided with a plurality of small openings **49**. Means can be provided for preventing glue from adhering to the plate in the form of a Teflon or chrome coat on the surface of the plate.

Glue is forced into the recess **44** in the blade **30** from a pressurized tank **51** which is connected by hoses **50** and pipes or tubes **53** to the passage **46**. The flow of glue to the blade **30** is controlled by means of pneumatic control valves **52** and metering valves **54** provided in pipes **53**. In this regard, the control valves **52** are connected to a solenoid valve **56** by hoses **58** and to a source of high pressure air through a hose **60**. The solenoid valve **56** is actuated once in each cycle of operation by means of a micro switch **62** which is actuated by a cam **64** on the tab cutting die **18**. The valve **52** is opened momentarily to allow a pulse of glue under pressure to flow into pipe **53**.

The amount of glue allowed to flow into the recess **44** is controlled by means of the metering valve **54**. The metering valve **54** is manually set to allow sufficient glue to flow into the recess **44** with sufficient pressure to provide a droplet of glue at each of the openings **49**.

In operation, the cut and scored blanks are moved from the die **14** far enough to align score line **15** with the edge **31** of blade **30**. When the blank stops, the micro switch **62** is closed to momentarily open valve **52** to force glue into recess **44** and out through holes **49**. The leading edge **17** of the blank is simultaneously folded back against the face of plate **48** by rotating bar **32** about the edge **31** of blade **30** with sufficient force to crease score line **15** and to press the leading edge against plate **48**.

At the end of the glue applying step, the now folded leading edge **17** of the blank **12** is pressed against the blanks by means of a number of drive rollers **76** provided downstream from the blade **30.**

The folded blank is then fed to the tabbing die **18** and stopped with the folded leading edge aligned in the die **18.** The die **18** is closed to cut the tab **21.** As the tabbing die **18** closes, the folding mechanism **19** is moved into engagement with the score line **13** to fold the folder blank.

I claim:

1. A machine for forming file folders having reinforced tabs, said machine comprising:

means for conveying blanks in succession along a longitudinal path,

a die positioned to cut and score said blanks,

folding means in the path of travel of each of said blanks for folding the lead edge against the blank to form a double ply, said folding means including means for applying glue to the folded edge of said blank as said edge of said blank is being folded,

means for pressing said folded edge of said blank against the blank to form a double ply on the lead edge of said blank,

and means for cutting the double ply to form a tab.

2. The machine according to claim **1** wherein said glue applying means includes a blade having an edge mounted transversely to and at an acute angle to the path of travel of said blanks, said blade including a front surface having a recess, a perforate plate secured to said front surface of said blade over said recess, and means for admitting glue under pressure into said recess whereby said glue will flow through said perforate plate.

3. The machine according to claim **2** including means for metering the amount of glue fed to said recess.

4. The machine according to claim **1** wherein said folding means includes a folding roller having a flat surface positioned to pivot about the edge of said blade whereby a blank disposed between said blade and roller will be folded about the edge of said blade.

5. An apparatus for folding and gluing the leading edge of a file folder blank against the blade to form a double ply, said apparatus comprising:

a blade having a front surface and an edge disposed transversely to the direction of travel of the file folder blanks,

means positioned to rotate about the edge of said blade to fold the leading edge of the file folder blank back against the front surface of the blade,

and means for metering glue onto the front surface of the blade.

6. The apparatus according to claim **5** wherein said blade includes an elongate recess in the front surface of the blade parallel to the blade edge and a perforate plate secured to said blade and overlying said recess.

7. The apparatus according to claim **6** wherein said metering means includes a container of glue under pressure and a tube connecting said container to said recess in said blade.

8. The apparatus according to claim **7** including a pneumatic valve in said tube for controlling the pressure of the glue in said recess.

9. The apparatus according to claim **8** including a metering valve in said tube for controlling the amount of glue admitted to said recess.

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