United States Patent [19]

Helm

[11] 3,728,918

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[54] ROTATABLE PANEL CUTTER

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[52] **U.S. Cl.** **83/22,** 83/37, 83/98, 83/346

[51] **Int. Cl.** **B26d 7/18**

[58] **Field of Search**.....82/22, 37, 100, 98, 82/99, 152, 323, 322, 346, 347, 349

[56] **References Cited**

UNITED STATES PATENTS

3,274,871	9/1966	Ehlscheid	83/99
3,380,327	4/1968	Stemmler	83/100
3,339,559	9/1967	Rupert	83/100 X
3,174,428	3/1965	Huck	83/100 X
3,209,630	10/1965	McCartan	83/100
3,106,121	10/1963	Novick	83/152
3,269,235	8/1966	Crouch	83/99

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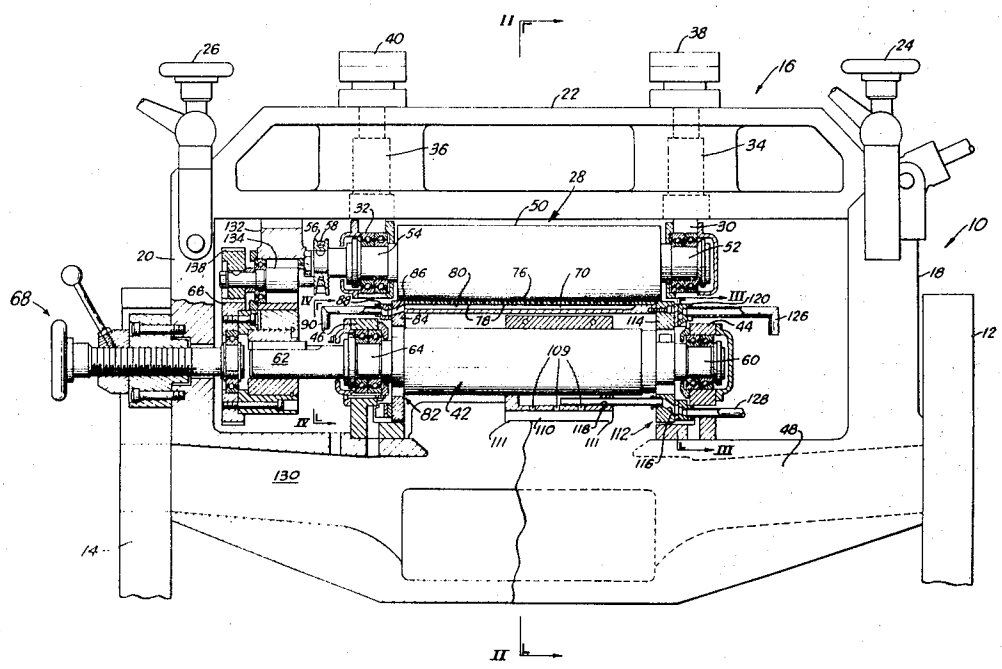
[57] **ABSTRACT**

Apparatus for cutting panels from blanks of sheet material that includes a cylindrical anvil roller rotatably supported on a bridge member. A die shaft is rotatably supported on a frame member and positioned below the anvil roller. The die shaft has one or more cutting dies or knives mounted on its periphery and a semi-cylindrical vacuum bar. The vacuum bar is positioned in spaced relation to the cutting dies and is arranged to engage different sized blanks of sheet material. The cutting dies may be positioned at various locations on the die shaft to simultaneously form panels of various sizes at various locations on the blank of sheet material. A first valve member is provided adjacent one end of the die shaft to impart a negative pressure or vacuum through longitudinal openings in the vacuum bar so that the blank of sheet material is engaged to the vacuum bar and conveyed between the dies and anvil roller positioned thereabove. A combination valve is secured adjacent the opposite end of the die shaft and is arranged to impart a negative pressure to the cutting dies while the panel is being severed from the blank and to apply a positive pressure and remove the panels severed from the blank. The anvil roller is arranged to rotate with the die shaft in the same direction as the die shaft or in a direction opposite to the direction of rotation of the die shaft. Other elements are provided to control the peripheral speed of the anvil roller and provide a differential rate of rotation between the anvil roller and the die shaft. The vacuum bar has a plurality of spaced openings that are adapted to engage different sized blanks of sheet material. The openings not employed to engage a particular sized sheet are covered with a tape material during operation of the apparatus.

14 Claims, 7 Drawing Figures



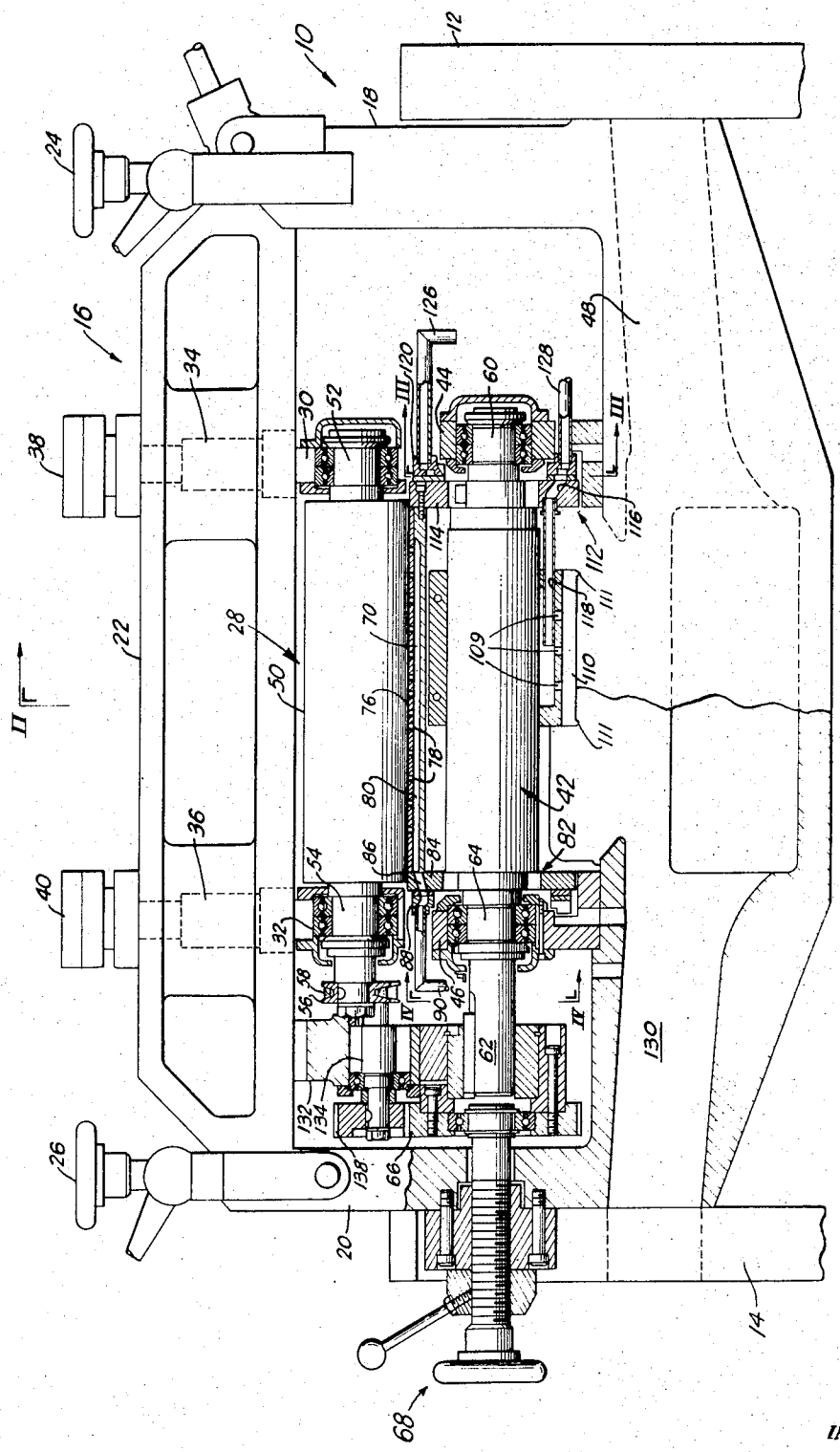


Fig. 1.

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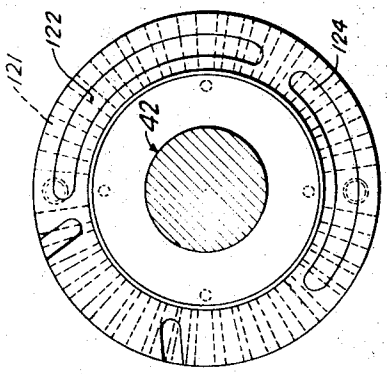

Fig. 3.

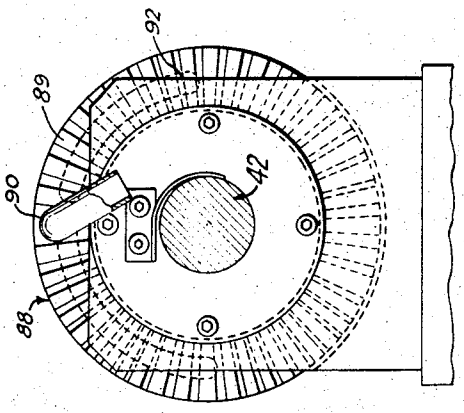

Fig. 4.

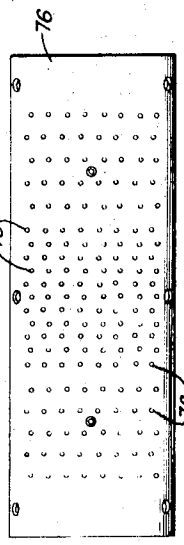

Fig. 5.

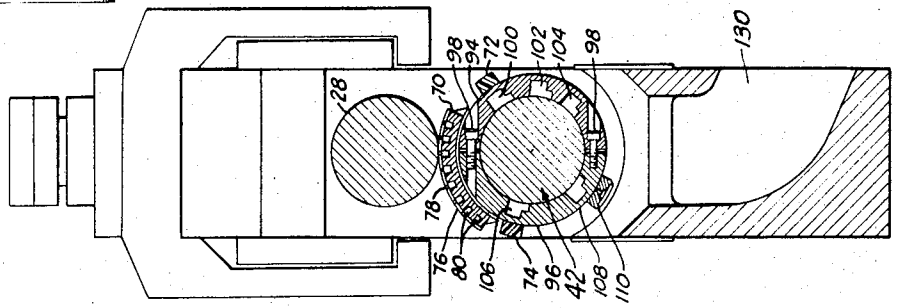

Fig. 2.

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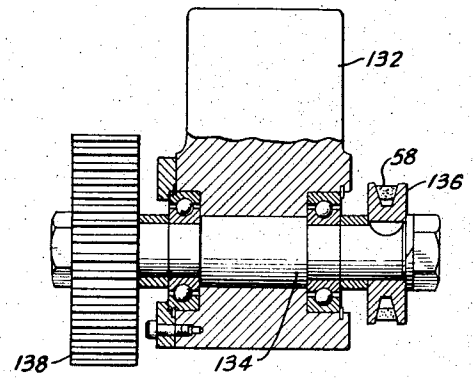

Fig. 6.

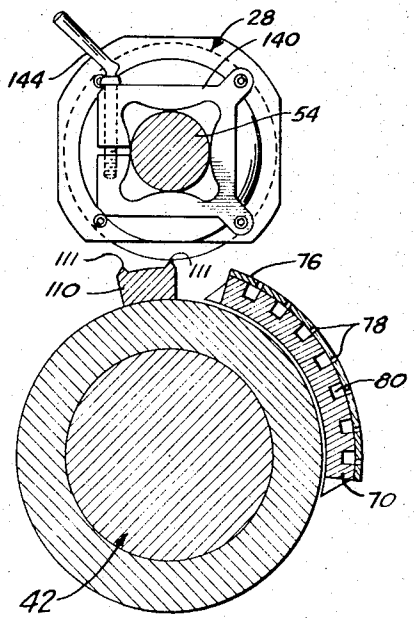

Fig. 7.

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ROTATABLE PANEL CUTTER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a method and apparatus for cutting one or more panels from a blank of sheet material and more particularly to a method and apparatus for engaging different sized blanks of sheet material to the die shaft and to cut one or more panels in the blank of sheet material.

2. Description of the Prior Art

As illustrated and described in U. S. Pat. Nos. 3,106,121 and 3,221,584, panel cutters in the past have been provided with an anvil roller and a die shaft positioned therebelow. The sheets of blank material were conveyed to the panel cutter mechanism by chain-like conveyors, as illustrated in the above patents. Vacuum and positive pressure were provided through axial openings in the die shaft for the cutter dies to both engage the portion of the blank from which the panel was to be severed and to engage the cut panel and then remove the panel from the die after the cutting operation. The axial bore with the radial connecting passageways in the die shaft reduced the strength of the die shaft and limited the adjustability of the position of the cutter die. The means for feeding the blanks to the panel cutter and for conveying the cut blanks therefrom included separate conveyor chains.

In U. S. Pat. No. 3,380,327 there is illustrated a die shaft with cutter dies positioned thereon and a means is provided through a sleeve for supplying both negative and positive pressures to the die. Means are also provided in one embodiment for providing a negative pressure to engage the blank to the die shaft while the panel is being severed therefrom. A stationary bar type anvil is positioned beneath the die shaft. The adjustment of the positive and negative pressure locations on the die shaft requires either a substitution or peripheral adjustment of sleeve members on the die shaft for different sized blanks and for changing the location of the panel window on the blank of sheet material.

U. S. Pat. No. 3,172,321, discloses an anvil member having a plurality of peripheral openings for engaging the blank of sheet material to the anvil member and conveying the blank between the nip of the rotating anvil and die shaft. In this reference the segments of the sleeve members must be adjusted on the anvil shaft or core to adjust the relative position of the sheet engaging means. The negative pressure for the peripheral openings is provided through an axial passageway in the anvil shaft.

U. S. Pat. No. 3,274,871 discloses a window cutting device that includes both a suction bar with a single row of openings therein and a die holder to engage several cutting dies. To adjust the suction bar and cutting dies for different sized blanks with different locations for the windows, it is necessary to rotate or adjust the suction bar on the die shaft for a different angular position relative to the cutting dies. The valves for supplying positive and negative pressure to the cutting dies and negative pressure to the suction bar must also be adjusted peripherally on the die shaft. There are axial bores in the die shaft connected to provide the positive and negative pressures to the cutting dies and suction bar.

SUMMARY OF THE INVENTION

This invention relates to a method and apparatus for cutting a panel or window in a blank of sheet material while the blank is being conveyed between a rotatable die shaft and an anvil roller. The die shaft is rotatably supported in a frame member and suitably connected to a drive means. A die holder is mounted on the periphery of the die shaft and has a plurality of spaced cutting die mounting means. Longitudinal passageways in the die holder connect the mounting means with an annular valve rotor mounted on the die shaft for rotation therewith. An annular stator is coaxially positioned on the die shaft and is connected to a source of positive pressure and negative pressure. Suitable grooves are provided in the stator to supply either positive pressure or negative pressure to the longitudinal passageways at preselected portions of each revolution of the die shaft to engage the blank of sheet material to the cutting die while the panel is being severed therefrom and to apply a positive pressure to the severed panel to discharge the panel from between the knife edges. A semi-cylindrical vacuum bar is secured to the die shaft in spaced relation to the die holder and has a plurality of longitudinal passageways therein with a plurality of spaced openings in the outer surface. A second valve rotor is mounted on the other end of the die shaft for rotation therewith and connects the longitudinal passageways with openings therein. A second valve stator is coaxially positioned on the die shaft and is connected to a source of negative pressure. Suitable arcuate grooves are formed in the face of the stator to provide negative pressure to the vacuum bar during a preselected portion of each revolution of the die shaft. With this arrangement, different sized blanks of sheet material may be conveyed by the vacuum bar between the die shaft and anvil roller in desired register, without removing or adjusting the vacuum bar. Also, the location and size of the cutting dies on the die shaft may be quickly changed by simply replacing, adjusting or repositioning the cutting dies.

The anvil roller is positioned in overlying relation with the die shaft and is rotatably supported from an overhead bridge member. Means are provided to rotate the anvil in timed relation with the die shaft either in the same direction as the die shaft or in a direction opposite thereto. Other means are provided to frictionally restrain rotation of the anvil roller. With this arrangement, where relatively large windows are formed in the blank or sheet material, the anvil roller is rotated to assist in conveying the blanks between the die shaft and anvil roller to thereby prevent tearing of the blanks. Where relatively small windows are formed in the blank, the rotation of the anvil roller may be frictionally restrained.

The panel cutter herein described and claimed is versatile in that it may be rapidly converted for different sized blanks and also rapidly converted for severing one or more panels at different locations on either the same or different blanks of sheet material.

Accordingly, the principal object of this invention is to provide a panel cutter that may be quickly converted for use with different sized blanks without dismantling and reassembling the apparatus.

Another object of this invention is to provide a panel cutter that has a rotatably mounted anvil roller that may be driven in the same or opposite directions as the die cutter shaft or restrained from rotation relative thereto.

These and other objects and advantages of this invention will be more completely disclosed and described in the following specification, the accompanying drawings and the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in front elevation and partially in section of my improved panel cutter mechanism.

FIG. 2 is a view in section taken along the line II—II of FIG. 1, illustrating in side elevation the relative position of the anvil roller and the die shaft with the vacuum bar and a single cutter die secured thereto.

FIG. 3 is a view in section taken along the line III—III in FIG. 1 illustrating the stator portion of the valve that provides both positive and negative pressure to the cutter dies.

FIG. 4 is a view in section taken along the line IV—IV illustrating the valve that provides negative pressure to the vacuum bar.

FIG. 5 is a plan view of the vacuum bar cover illustrating the plurality of openings therein for engaging blanks of sheet material at various locations thereon.

FIG. 6 is a fragmentary view in elevation of the drive means for the anvil roller.

FIG. 7 is a fragmentary view in side elevation of the anvil roller and die shaft illustrating the manner for controlling the relative rate of rotation of the anvil roller.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, there is illustrated an envelope making machine generally designated by the numeral **10** that has a pair of spaced side frames **12** and **14**. The side of the machine with frame **12** is the drive side and the side with frame **14** is the operator's side. A panel cutter generally designated by the numeral **16** has a pair of side frames **18** and **20** secured to the respective machine side frames **12** and **14**. A transverse upper bridge member **22** is pivotally secured to the panel cutter side frame **18** and is engaged to the panel cutter side frames **18** and **20** by means of clamping devices **24** and **26**.

An anvil roller generally designated by the numeral **28** is rotatably mounted in pillow blocks **30** and **32** for rotation therein. The pillow blocks **30** and **32** are secured to the bridge member **22** by means of telescopic adjustment members **34** and **36**. Suitable adjusting devices **38** and **40** permit the vertical movement of the anvil roller **28** relative to the bridge member **22**. A die shaft generally designated by the numeral **42** is rotatably supported in pillow blocks **44** and **46** that are, in turn, secured to and supported by a lower horizontal bridge or base member **48** of the panel cutter **16**.

The anvil roller **28** has a peripheral cylindrical surface **50** and a shaft end portion **52** of reduced diameter rotatably supported in the bearings of pillow block **30**. The anvil roller **28** has a second shaft end portion **54** of reduced diameter with an intermediate portion rotatably positioned in the bearings of pillow block **32**. The end portion **54** extends beyond the pillow block **32** and, as illustrated in FIG. **1**, has a sheave **56** secured thereto. As later described, a flexible belt **58** is reeved about the sheave **56** and rotates the anvil roller **28** at a preselected speed. The belt **58** may also be removed from the sheave **56** and, as later described, the shaft end portion may be engaged by a friction device to control the rotation of anvil roller **28**.

The die shaft **42** has a first shaft end portion **60** of reduced diameter rotatably supported in the pillow block **44** and a second shaft end portion **62** of reduced diameter with an intermediate portion **64** rotatably supported in pillow block **46**. The shaft end portion **62** is connected to a gear **66** for rotation by an external drive means. A register mechanism **68** is provided to move the die shaft for register of the panel cutting dies with the blanks of sheet material.

The die shaft **42** is preferably fabricated as a solid metallic member and is positioned beneath the anvil roller **28**. A vacuum bar **70** is secured to the outer surface of the die shaft **42** and has an arcuate configuration conforming to the surface of the die shaft **42**. The vacuum bar is suitably supported on the die shaft **42** and suitably secured at its end portions to the valve rotor members, later described. An arcuate vacuum plate **76** is secured to the vacuum bar **70** and, as illustrated in FIG. **5**, has a plurality of rows of apertures **78** therein. The rows extend longitudinally on the plate **76** in spaced relation to each other and in overlying relation with the longitudinal passages **80** in the vacuum bar **70**. Longitudinal bars **72** and **74** (FIG. **2**) are secured to the die holders, later described, to support the blank.

A valve member generally designated by the numeral **82** has a rotor portion **84** secured to the die shaft for rotation therewith. The rotor **84** has a plurality of openings **86** that are aligned with the longitudinal openings **80** in the vacuum bar **70**. The valve member **82** has a stator portion **88** illustrated in FIG. **4**, that is axially aligned with the rotor portion **84** and has a source of reduced pressure or vacuum connected thereto through the conduit **90**. The stator **88** has an arcuate groove **92** in the inner wall that connects with the passageways **86** in the rotor **84** during a portion of each revolution of the die shaft **42**. With this arrangement, the longitudinal passageways **80** have a negative pressure therein when the passages **86** associated therewith are in overlying relation with a portion of the arcuate groove **92** to thereby provide a negative pressure or vacuum in the respective peripheral openings or apertures **78** in the plate **76** connected to the respective longitudinal passageway **80**. The stator **88** has radially extending pine **89** on the outer face to dissipate heat.

The vacuum plate **76** is arranged upon rotation to engage the sheet of blank material to the periphery of the vacuum plate **76** and to convey the sheet of blank material while engaged thereto through the nip between the anvil roller **28** and die shaft **42**. The vacuum bar and vacuum plate combination is arranged by means of the valve **82** to maintain the blank material engaged thereto while the leading edge of the blank is conveyed through the nip between the anvil roll **28** and die shaft **42** and to release the leading edge of the blank as it passes a preselected distance beyond the nip previously described. Because of the elongated arcuate

groove 92, in the valve stator 88, other portions of the blank may be engaged to the vacuum plate 76 after the leading edge has been released therefrom. The vacuum bar 70 and vacuum plate 76 provide a substantial semi-cylindrical area on the die shaft with apertures 78 therein to engage blanks of different size thereon. The apertures 78 not utilized for a particular sized blank may be conveniently closed by means of pressure sensitive tape or the like on the external surface of the vacuum plate 76. With this arrangement, the apertures in the vacuum plate 76, which provides a negative pressure for engaging the blank may be quickly and accurately changed with strips of pressure sensitive tape. The engaging of the blank leading edge to a preselected portion of the vacuum plate 76 may be also easily adjusted or changed for cutter dies positioned at different locations on the die shaft without moving the vacuum plate peripherally.

As illustrated in FIG. 2, the die shaft 42 has a pair of semi-circular die holders 94 and 96 secured thereto by means of pairs of bolts 98 at opposite ends of the die holders 94 and 96. The die holder segment 94 has three longitudinal passageways 100, 102 and 104 therein with radial openings to the outer surface thereof. Suitable means are provided adjacent the passageways 100, 102 and 104 to secure a die cutter knife to the outer periphery of the segment 94 at that location. The die segment 96 has a similar pair of longitudinal openings 106 and 108 with similar radial openings and means for securing a die cutter knife thereto. FIG. 2 illustrates a die cutter knife 110 secured to the die holder 96 and connected to the passageway 108. The die cutter knife 110 is illustrated in section in FIG. 1 and illustrates the radial openings 109 for the negative pressure or vacuum to engage the panel and also illustrates the plurality of knife edges 111 to sever the panel from the blank.

A second valve generally designated by the numeral 112 as illustrated in FIGS. 1 and 3, has a rotor portion 114 secured to the die shaft 42 for rotation therewith. The rotor 114 has a plurality of apertures 116 therethrough that communicate by means of conduits 118 to the passageways 100, 102, 104, 106 and 108. The valve member 112 has a stator 120 coaxially positioned relative to the die shaft 42 and in nonrotatable relation therewith. The stator has a first annular groove 122 and a second annular groove 124 (see FIG. 3). The annular groove 122 is connected by means of a conduit 126 to a source of negative pressure or vacuum to thereby provide a negative pressure or vacuum through conduit 118 to the inner portion of the cutter die knife 110 while the die shaft 42 rotates through the arc illustrated, similar to the arc of the groove 122. The arcuate groove 124 is connected through conduit 128 to a source of positive pressure to thereby provide a source of positive pressure to the area between the knife edges 111 of the cutting die 110 when the cutting die 110, upon rotation of die shaft 42 passes through an arc the same as the arc of arcuate groove 124. The outer face of the stator has radial fins 121 to dissipate heat. With this arrangement, the blank of sheet material in overlying relation with the knife edges of the cutter die 110 is engaged to the knife edges shortly before the cutter die 110 severs the panel from the sheet of blank material. The panel severed from the sheet of blank material remains engaged to the cutter die by the negative pressure after the panel is severed from the sheet of blank material and until the cutter die 110 rotates beyond the end of groove 122. As the die shaft 42 continues to rotate the conduit 118 in longitudinal passageway 108 associated with cutter die 110 moves into overlying relation with the annular groove 124 and the positive pressure in groove 124 exerts a positive pressure between the knife edges of cutter die 110 and dislodges the cut panel therefrom.

As is illustrated in FIGS. 1 and 2, the lower base portion 48 of the panel cutter bridge has a vertical passageway 130 with a negative pressure exerted thereon through which the dislodged panels are removed from the panel cutter 16. WIth the above arrangement, a panel cutter knife may be secured to the die holder segments 94 or 96 at any of the locations where longitudinal passageways 100, 102, 104, 106 and 108 are positioned therein so that one or more panels at different locations on the blank of sheet material may be cut as the blank is conveyed between the die shaft and anvil roller 28. Depending on the size of the blank and the desired position for the windows therein, the location at which the blank is engaged to the vacuum bar cover 76 may be controlled by positioning pressure sensitive tape or other suitable blocking means over the apertures in the vacuum plate 76 not in use. To change to another, different sized blank with panels formed therein at different locations, the desired apertures 78 on the vacuum bar 76 are opened and the other apertures are closed, as previously discussed. The desired location of the cutter die relative to one of the five longitudinal openings 100, 102, 104, 106 and 108 is selected and a cutter die is secured thereto.

As is illustrated in FIGS. 1 and 6, an idler shaft support member 132 is preferably secured to the upper bridge member 22 and has an idler shaft 134 rotatably supported therein with a sheave 136 secured to one end and a gear 138 secured to the opposite end. The gear 138 meshes with gear 66 to rotate shaft 134 at a preselected rate relative to the die shaft 42. The flexible belt 58 is reeved about pulleys 56 and 136 to rotate the anvil roller at a preselected rate of rotation relative to the die shaft 42. Where desired, suitable intermediate gears may be positioned between gears 66 and 138 to rotate anvil roller 28 in a direction opposite to the direction of rotation of die shaft 42.

Where desired, as illustrated in FIG. 7, a pinch clamp 140 may be suitably secured to the bridge 22 and positioned around an intermediate portion of the anvil roller shaft end portion 54, preferably adjacent between the sheave 56 and pillow block 32. Suitable tightening means such as bolt 144 may be provided to control the friction between the clamp 140 and the anvil roller shaft end portion 54 to limit the rate of rotation of the anvil roller 28 or, where desired, maintain the anvil roller in a relatively fixed position while the die shaft 48 rotates at a preselected speed. It may be advantageous for small window or panel openings to provide a relatively stationary anvil 28, preferably fabricated from a material softer than the die knife edges. The cylindrical anvil 28 would thus provide an almost infinite number of cutting surfaces so that when a portion of the cutting surface is worn, the anvil shaft 28 may be rotated slightly to provide a new cutting sur-

face. Where desired, a knob and dial can be provided with the pinch clamp to maintain relatively accurate settings of the backing surface provided for the cutting dies.

Where, on the other hand, it is desired to cut larger window openings in the blanks, it is preferable that the anvil roller **28** to be either driven in the same direction as the die shaft **42** or permitted to rotate freely in the bearings. For intermediate sized windows or panels, it may be desirable to exert a controlled friction on the anvil roller **28** by means of pinch clamp **140** to thereby limit the rate of rotation of the anvil roller **28** relative to the die shaft **42**. With this arrangement, it is a relatively simple procedure to change over from the substantially stationary type anvil to a rotating anvil that rotates at a preselected speed relative to the die shaft. With the versatility in change-over of the die cutters on the die shaft and the versatility of adjusting the manner in which the blank is engaged by the vacuum bar, it will be apparent that a change-over from either one sized blank of sheet material to another and/or a change-over from the size of the panel or panels formed in the blank of sheet material may be accomplished rapidly without dismantling the panel cutter.

According to the provisions of the patent statutes, the principle, preferred construction and mode of operation of this invention have been explained and what is now considered to represent its best embodiment has been illustrated and described. However, it should be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. Apparatus for cutting panels from blanks of sheet material comprising,

a die shaft rotatably supported in a frame member,

panel cutting means mounted on said die shaft,

sheet engaging means mounted on said die shaft in spaced peripheral relation to said panel cutting means,

an anvil roller rotatably supported in said frame member in spaced parallel relation to said die shaft,

drive means to rotate said die shaft and convey said blanks of sheet material on said die shaft by said sheet engaging means between said panel cutting means and said anvil roller to cut said panel from said blank of sheet material, and

friction means to engage said rotatable anvil roller and limit the rotation of said anvil roller relative to said die shaft.

2. Apparatus for cutting panels from blanks of sheet material comprising,

a die shaft rotatably supported in a frame member,

panel cutting means mounted on said die shaft,

a semi-cylindrical vacuum sheet engaging means mounted on said die shaft for rotation therewith and in spaced relation to said panel cutting means, said sheet engaging means having a plurality of rows of spaced apertures in the outer surface thereof arranged to engage blanks of sheet material of different size by means of a negative pressure in said apertures,

a valve member mounted on said die shaft and arranged to provide negative pressure to said apertures in said sheet engaging means during preselected degrees of rotation of said die shaft,

anvil means positioned in spaced relation to said die shaft and arranged to provide a backing member for said panel cutting means during the cutting of panels from said blanks of sheet material, and

means to rotate said die shaft and convey said blanks of sheet material by said sheet engaging means on said die shaft between said panel cutting means and said anvil means to cut said panels from said blank of sheet material.

3. Apparatus for cutting panels from blanks of sheet material as set forth in claim **2** in which,

said first valve member includes an annular rotor secured to and rotatable with said die shaft and a stator member coaxially positioned on said die shaft in nonrotatable relation thereto.

4. Apparatus for cutting panels from blanks of sheet material as set forth in claim **2** which includes,

a second valve member coaxially positioned on said die shaft to provide positive and negative pressure to said panel cutting means mounted on said die shaft during preselected degrees of rotation of said die shaft.

5. Apparatus for cutting panels from blanks of sheet material as set forth in claim **2** in which said anvil means includes,

an anvil roller rotatably supported in said frame member in spaced parallel relation to said die shaft.

6. A method for cutting panels from blanks of sheet material comprising,

selectively closing a plurality of apertures on the surface of sheet engaging means mounted on a die shaft and retaining open a selected plurality of apertures on the surfaces of said sheet engaging means,

engaging a portion of the blank of sheet material to said sheet engaging means by a negative pressure through open apertures on the surface of said sheet engaging means,

engaging a second portion of said blank of sheet material to a panel cutting means mounted on said die shaft,

rotating said die shaft and conveying said blank of sheet material between said die shaft and an anvil means positioned in spaced relation to said die shaft,

cutting said panel from said blank of sheet material between said panel cutting means and said anvil means,

thereafter terminating the negative pressure through said open opertures on the surface of said sheet engaging means to disengage the first portion of said blank of sheet material from said die shaft, and

removing said panel from said panel cutting means.

7. A method of cutting panels from blanks of sheet material as set forth in claim **6** which includes,

applying pressure-sensitive tape to portions of the surface of said sheet engaging means to close preselected apertures in said sheet engaging means.

8. A method of cutting panels from blanks of sheet material as set forth in claim **6** which includes,

rotating said anvil means with said die shaft in timed relation thereto while cutting said panel from said blank of sheet material.

9. Apparatus for cutting panels from blanks of sheet material as set forth in claim 2 in which said sheet engaging means includes,

a semi-cylindrical vacuum bar secured to said die shaft, said vacuum bar having a plurality of spaced longitudinal passageways therein,

said passageways connected through said valve member to a source of negative pressure through a preselected portion of each revolution of said die shaft.

10. Apparatus for cutting panels from blanks of sheet material as set forth in claim 9 which includes,

a semi-cylindrical plate positioned in overlying relation with said vacuum bar and secured thereto,

said plurality of rows of apertures extending longitudinally on said plate, said apertures positioned in overlying relation with said longitudinal passageways in said vacuum bar.

11. Apparatus for cutting panels from blanks of sheet material as set forth in claim 4 in which,

said second valve member includes an annular rotor secured to and rotatable with said die shaft and a stator member coaxially positioned on said die shaft in nonrotatable relation thereto.

12. A method for cutting panels from blanks of sheet material as set forth in claim 6 which includes,

opening certain of said apertures on the surface of said sheet engaging means and selectively closing certain of said apertures on the surface of said sheet engaging means to thereby engage a different sized blank of sheet material on said sheet engaging means.

13. Apparatus for cutting panels from blanks of sheet material as set forth in claim 4 in which said panel cutting means includes,

an annular die holder coaxially secured to said die shaft,

said annular die holder having a plurality of longitudinal passageways therethrough spaced circumferentially around said die shaft,

said annular die holder outer surface having openings therein connected to said longitudinal passageways,

means to connect one or more cutting dies to the outer surface of said annular die holder in overlying relation with circular longitudinal passageways in said annular die holder.

14. Apparatus for cutting panels from blanks of sheet material as set forth in claim 13 which includes a second valve member coaxially positioned on said die shaft to provide positive and negative pressure to said longitudinal passageways in said annular die holder during preselected degrees of rotation of said die shaft, and

means to selectively connect said second valve member to said longitudinal passageways.

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