United States Patent [19]

Castille

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[54] **ADJUSTABLE DIE PLATE**

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[51] **Int. Cl.** **B31b 1/16,** B26d 1/12

[58] **Field of Search** ..... 93/58.1, 58.2, 58.2 F; 76/107; 83/699, 700, 343, 346, 347, 678, 696

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Assistant Examiner—James F. Coan
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[57] **ABSTRACT**

A system of four arcuate dies are adapted to be mounted in evenly spaced threaded holes in a rotary cylinder for a cardboard box fabricating machine. The positions of three of the dies are adjustable either longitudinally or circumferentially, or both, on the rotary cylinder whereby the dimensions of the cardboard boxes manufactured may be varied infinitely. Further, the position of a single die plate on the rotary cylinder may be adjusted both longitudinally and circumferentially of the rotary cylinder to an infinite number of positions.

14 Claims, 6 Drawing Figures

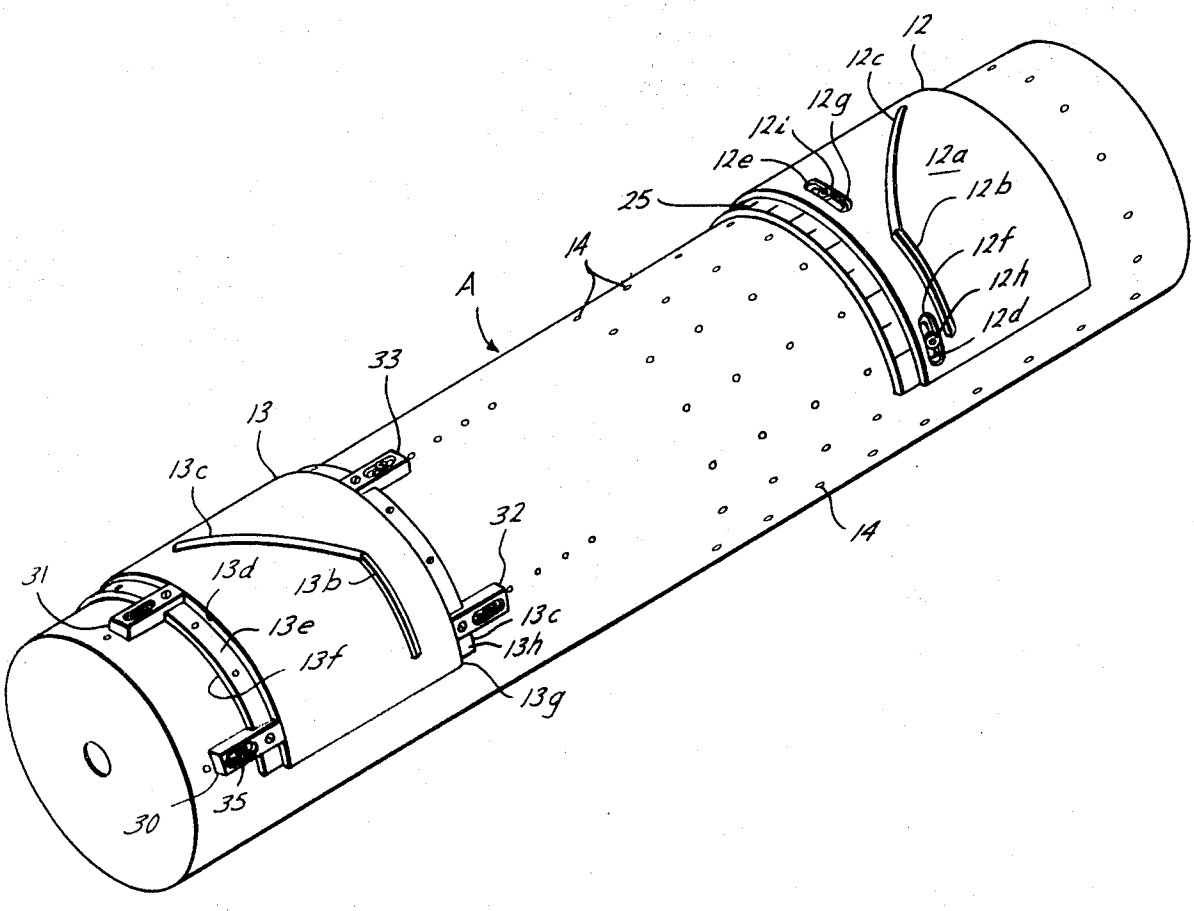


Fig. 1

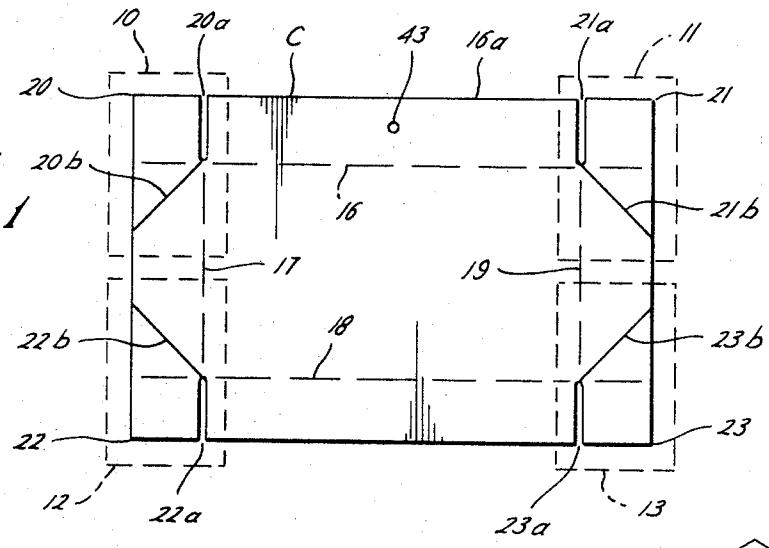


Fig. 4

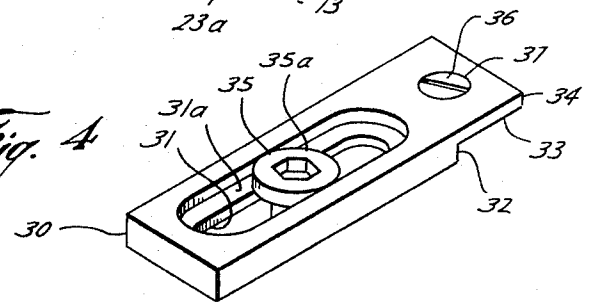


Fig. 5

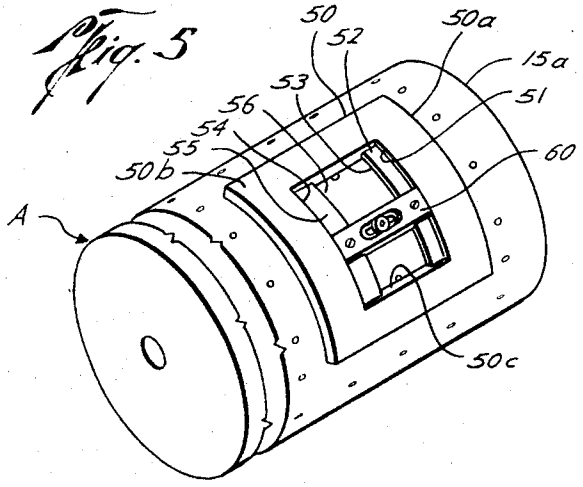
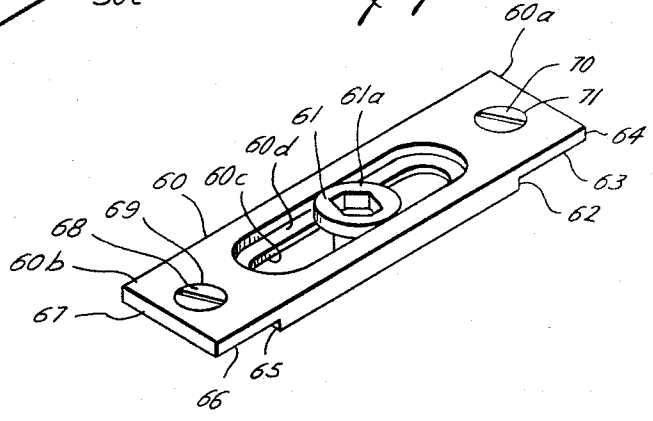


Fig. 6



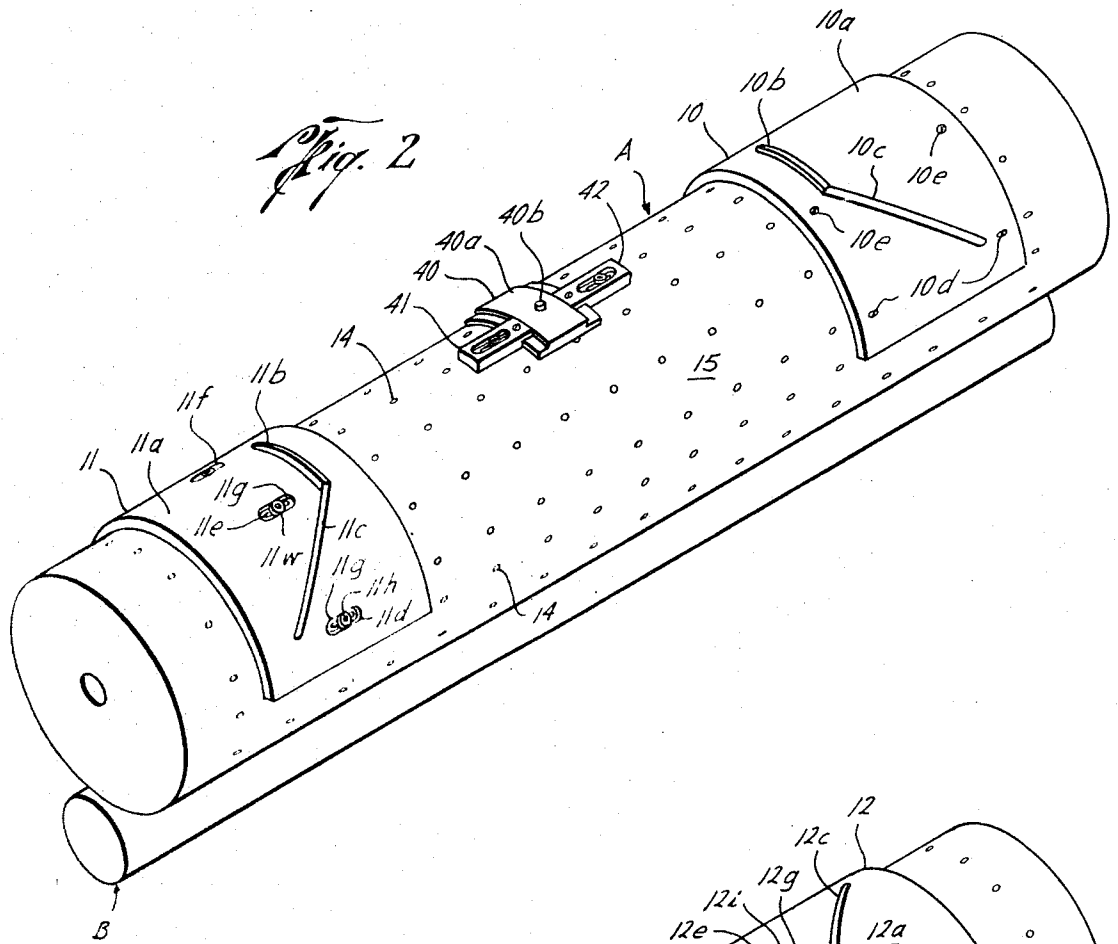

10a
10b
10
10c
10e
10e
10d
A
42
40b
40a
40
41
14
15
11b
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11
11a
11g
11e
11w
11c
11g
11h
11d
14
B

Fig. 2

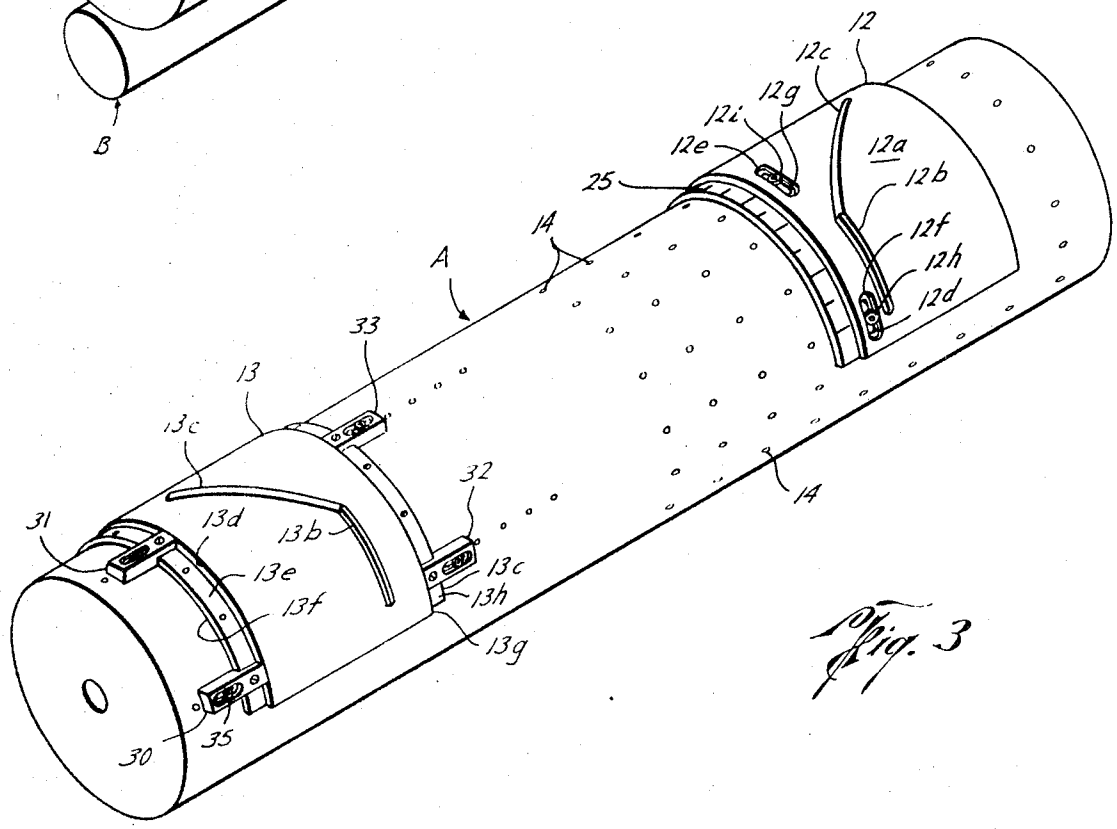

12
12c
12g
12i
12e
12a
12b
25
12f
12h
12d
14
A
33
13
13c
32
31
13d
13b
13e
13c
13h
13f
13g
30
35
14

Fig. 3

ADJUSTABLE DIE PLATE

BACKGROUND OF THE INVENTION

The field of the invention relates to the fabrication of boxes, such as cardboard boxes.

One type of cardboard box fabricating machine has an elongated cylinder mounted therein for rotation. The rotary cylinder is hollow and has threaded holes which are evenly spaced longitudinally and circumferentially about the cylindrical wall of the longitudinal cylinder.

In the prior art, dies which included arcuate die plates with cutting and scoring blades mounted thereon were mounted by bolts in the evenly spaced holes in such a rotary cylinder to engage cardboard sheets as the rotary cylinder rotated. The dies performed cutting and scoring operations on the cardboard sheets so that boxes or other special purpose cardboard pieces could be formed out of the cardboard sheets. For instance, a series of four arcuate dies would be mounted on the rotary cylinder to cut and score a piece of cardboard in such a manner that the piece could easily be formed into an open or closed box having a certain style of corners.

In the manufacture of boxes, it is often necessary to fabricate similarly styled boxes of various sizes. However, to vary the length and width of a box being fabricated from four prior art dies mounted on the rotary cylinder, it was necessary to move three of the four dies to other evenly spaced holes in the cylinder. Thus, the variations in the length and width of similarly styled boxes were limited to the distances between the evenly spaced holes in the rotary cylinder. And, if it was necessary to fabricate a size of box that differed in length or width by some fraction of the distance between the evenly spaced holes, then new dies would have to be manufactured with the cutting and scoring blades in different positions.

Attempts have been made to vary one dimension, such as the length or the width of a box, by varying the longitudinal spacing or the circumferential spacing of the dies between the evenly spaced holes. However, insofar as known, no one has been able to successfully devise dies which can be adjusted on the rotary cylinder both longitudinally and circumferentially for distances less than the distance between the evenly spaced holes.

SUMMARY OF THE INVENTION

It is an object of this invention to provide adjustable dies which provide for varying the dimensions of cardboard boxes made from cardboard sheets.

This and other objects are accomplished by providing an adjustable clamp which mounts an arcuate die plate on the rotary cylinder of a cardboard box fabricating machine. The clamp member engages the die plate and provides means for adjusting the position of said die plate both longitudinally and circumferentially a distance less than the distance between the longitudinally and circumferentially spaced holes on the rotary cylinder.

One feature of this invention is a system of four dies for making a cardboard box where the positions of the dies can be adjusted such that both the length and width of the boxes can be varied by distances which are some fraction of the distances between the evenly spaced holes.

BRIEF DESCRIPTION OF THE DRAWINGS

The preferred embodiment of this invention will be described hereinafter, together with other features thereof, and additional objects will become evident from such description.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof wherein an example of the invention is shown and wherein:

FIG. 1 illustrates a cardboard sheet which has been fabricated by the adjustable dies of the preferred embodiment of this invention;

FIG. 2 is a perspective view of the adjustable dies for cutting and scoring two of the corners of the cardboard sheet of FIG. 1; a separate adjustable die for cutting a hole also is illustrated;

FIG. 3 is a perspective view of the adjustable dies for cutting and scoring the other two corners of the cardboard sheet of FIG. 1;

FIG. 4 is a detailed perspective view of the clamp member which provides means for adjusting a die plate both longitudinally and circumferentially of the rotary cylinder;

FIG. 5 is a perspective view of an adjustable die adapted for mounting at the end of a rotary cylinder; and

FIG. 6 is a detailed perspective view of the clamp member for the adjustable die of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the drawings, the letter A generally designates a rotary cylinder which is mounted for rotation on a cardboard box fabricating machine (not shown). Roller means B which may take other forms, is a longitudinal roller B which is positioned adjacent to the rotary cylinder A in order to cause a cardboard sheet C, illustrated in FIG. 1 to be engaged by the rotating rotary cylinder.

A plurality of adjustable dies **10, 11, 12** and **13** are mounted on the rotary cylinder of the cardboard box fabricating machine in order to cut and score the corner areas of the cardboard sheet C so that a box can be formed therefrom. The rotary cylinder A has a plurality of evenly spaced holes **14** which are evenly spaced both longitudinally along the axis of rotation and circumferentially with respect to the rotary cylinder. The adjustable dies **10** and **11** illustrated in FIG. **2** are mounted on one side of the rotary cylinder and the adjustable dies **12** and **13** shown in FIG. **3** are mounted on the other side of the rotary cylinder and are positioned such that the dies will engage the cardboard sheet C as the cardboard sheet is passed between the rotary cylinder A and the roller means B.

Before describing the actual structure and operation of the plurality of adjustable dies, it is necessary to examine the cardboard sheet C. The dotted lines **16, 17, 18** and **19** represent lines of indentation in the cardboard sheet which allow the cardboard sheet to be folded along these lines easily. These lines of indentation may be scored on the cardboard sheet C by means other than the rotary cylinder A and dies **10, 11, 12** and **13** described herein. Corner areas **20, 21, 22** and **23** of the cardboard sheet have slots such as **20*a*** and a line of indentation such as **20*b*** such that a box formed from the cardboard sheet C has identically styled corners.

The box that is formed from the cardboard sheet C is an open-ended box. The details of actually assembling the box are not related to this invention and are quite obvious to any person skilled in the area of fabricating boxes. The length of the box formed from the cardboard sheet C is the distance between the lines of indentation **17** and **19** and the width is the distance between the lines of indentation **16** and **18.** After a box is formed from the cardboard sheet, the lines of indentation **20***b*, **21***b*, **22***b* and **23***b* allow the box to be flattened for shipping prior to use. In FIG. **1** the adjustable dies **10, 11, 12** and **13** are shown superimposed upon the cardboard sheet C to better illustrate the fabricating operations that the dies perform on the corner areas of the cardboard sheet C. The adjustable dies **10** and **11** engage corner areas **20** and **21** as the cardboard sheet is passed between the rotary cylinder A and the roller means B cut slots **20***a* and **21***a* and indent or "score" indented lines **20***b* and **21***b*. Similarly, the adjustable dies **12** and **13** engage the corner areas **22** and **23** and cut out slots **22***a* and **23***a* and score indented lines **22***b* and **23***b*.

As discussed previously, it is often desirable to change the length and the width of the box fabricated by amounts or distances less than the distances between adjacent evenly spaced holes **14** in the rotary cylinder A. In accordance with the preferred embodiment of this invention, the adjustable dies **11, 12** and **13** are provided so that an infinite number of box sizes may be fabricated using these dies. The adjustable die **10** includes an arcuate die plate **10***a* having a curvature such that it is adapted to conform to cylindrical wall **15** of the rotary cylinder. Mounted on the die plate **10***a* is a cutting blade **10***b* which cuts the slot **20***a* in the cardboard sheet C. A scoring blade **10***c* which is simply a blunt blade, is also mounted on the die plate **10***a* in order to score or indent the line of indentation **20***b* in the cardboard sheet as the sheet is driven between the die **10** and the roller B.

The die plate **10***a* is secured to the rotary cylinder by means of bolts such as **10***d* and **10***e* which extend through the die plate and threadedly engage threaded holes **14** in the rotary cylinder.

The adjustable die **11** comprises an arcuate die plate **11***a* adapted to be mounted on the rotary cylinder. A cutting blade **11***b* and a scoring blade **11***c* are mounted on the die plate **11***a* in order to cut the slot **21***a* and score the line of indentation **21***b* in the cardboard sheet C.

To adjust the length of the cardboard box to be fabricated means are provided for adjusting the position of the die plate **11***a* longitudinally with respect to the die plate **10***a*. This adjusting means is provided by the elongated slots **11***d*, **11***e* and **11***f* which extend longitudinally with respect to the rotary cylinder. Elongated washers such as **11***g* are counter sunk in the elongated slots in the die plate **11***a* to protect the die plate. Mounting means or bolts such as **11***h* extend through the elongated slots to mount the die plate **11***a* on the rotary cylinder. The bolts **11***h*, when screwed to a position out of engagement with the washers **11***g*, allow the position of the die plate **11***a* to be adjusted longitudinally between adjacent, longitudinally spaced holes in the rotary cylinder. When the bolts are tightened down against the die plate **11***a*, the die plate is secured on the rotary cylinder.

The elongated slots **11***d*, **11***e* and **11***f* are approximately equal in length to the distance between any two adjacent, longitudinally spaced holes such that the die plate is adjustable to any fraction of the distance between two longitudinally spaced adjacent holes. Of course, if it is desired to adjust the length of the box more than a fraction of the distance between two adjacent, longitudinally spaced holes in the rotary cylinder, the bolts **11***f* are simply moved to another of the longitudinally spaced holes and then the die plate is adjusted to whatever fraction of the distance between adjacent holes is necessary to attain the desired new length for the box to be manufactured.

A third adjustable die plate **12** also comprises an arcuate die plate **12***a* with a cutting blade **12***b* for cutting the slot **22***a* in the cardboard sheet and a scoring blade **12***c* for scoring the line of indentation **22***b* in the cardboard sheet.

The die plate **12***a* is mounted such that the position of the die plate is adjustable even to fractions of the distance between adjacent circumferentially spaced holes in the rotary cylinder. Arcuate, elongated slots such as **12***d* and **12***e* are cut in the die plate **12***a* such that their longitudinal axis extends circumferentially with respect to the rotary cylinder. Arcuate elongated washers **12***f* and **12***g* are countersunk in the slots and bolts **12***l* and **12***i* extend through the slots **12***d* and **12***e*, respectively, in order to secure the die plate **12***a* on the rotary cylinder. With the bolts **12***h* and **12***i* out of engagement with the elongated washers **12***f* and **12***g*, respectively, the die plate **12***a* is adjustable circumferentially with respect to the adjustable dies **10** and **11.**

The length of the elongated slots **12***d* and **12***e* is substantially equal to the distance between adjacent, circumferentially spaced holes in the rotary cylinder such that the die plate **12** can be adjusted to any fraction of the distance between adjacent circumferentially spaced holes. As a point of interest, a circumferential scale **25** may be provided for ease in measuring linear distances in a circumferential direction about the cylinder.

The adjustable die **13,** which is adjustable both longitudinally and circumferentially with respect to the other dies so that both the width and the length of a box can be adjusted, includes an arcuate die plate **13***a*. A cutting blade **13***b* is mounted on the die plate to cut the slot **23***a* in the cardboard sheet and a scoring blade **13***c* is mounted thereon to score the line of indentation **23***b* in the cardboard sheet. One side of the die plate **13***a* is offset to provide mounting surfaces **13***d*, **13***e* and **13***f;* and, in a similar manner, the other side of the die plate **13***a* has the mounting surfaces **13***g*, **13***h* and **13***i*.

In order to adjust the die plate **13***a* both longitudinally and circumferentially with respect to the other dies, clamp members **30, 31, 32** and **33** are mounted onto the rotary cylinder against the die plate **13***a*. Since the clamp members are identical, except for being disposed against opposite mounting surfaces on the die plate, only the clamp member **30** illustrated in FIG. **4** will be described in detail. The clamp member **30** has a substantially elongated slot **31** extending through the clamp member. The slot **31** is recessed such that a mounting surface **31***a* is provided.

The clamp member **30** is offset to provide a mounting face **32,** which is adapted to engage the corresponding die plate mounting surface **13***f*. A mounting face **33** is adapted to engage the corresponding mounting surface **13***e* on the die plate; and, a mounting face **34** is adapted

to engage the corresponding mounting surface 13*d* on the die plate.

A mounting bolt 35 extends through the elongated slot into threaded engagement with a hole in the rotary cylinder and bolt head 35*a* is seated on the recessed mounting surface 31*a* in the slot to secure the clamp member against the rotary cylinder.

A threaded nut 36 extedns through a threaded hole 37 in the clamp member and mounting face 33 to engage the corresponding mounting surface 13*e* to further secure the die plate against circumferential movement on the rotary cylinder. The clamp member 31 is mounted against the mounting surfaces 13*d*, 13*e* and 13*f* in a manner similar to the clamp member 30; and the clamp members 32 and 33 are mounted against the mounting surfaces 13*g*, 13*h* and 13*i* on the other side of the die plate 13*a* in a manner similar to the clamp member 30.

In order to adjust the position of the die plate 13*a* both longitudinally and circumferentially with respect to the other die plates, the bolts, such as the bolt 35 extending through the slot 31 in the clamp member 30, are loosened from the clamp members and the threaded nuts, such as the threaded nut 36 for the clamp member 30, are also loosened. With the bolts loosened or out of engagement with the recessed surfaces such as 31*a* of the slot 31 in the clamp member 30, the clamp members and the die plate are adjustable longitudinally with respect to the dies 10 and 12 so that the length of the box to be manufactured may be varied, even to a fraction of a distance between adjacent, longitudinally spaced holes in the rotary cylinder.

The die plate 13*a* is also adjustable circumferentially with respect to the rotary cylinder A, and the loosened clamp members 30, 31, 32 and 33 by sliding the die plate 13*a* circumferentially with respect to the loosened clamp members 30, 31, 32 and 33. In this manner, the width of the box may be adjusted, even to a fraction of the distance between adjacent circumferentially spaced holes in the rotary cylinder. After the die plate 13*a* is in its adjusted position, the bolts, such as the bolt 35 for the clamp member 30, are tightened down into the elongated slots so that the clamp members secure the die plate against the rotary cylinder.

The threaded nuts such as 36 for the clamp member 30 may then be tightened against the corrsponding mounting surfaces 13*e* and 13*h* so that the die plate is further secured against the rotary cylinder. With the clamp members secured against the rotary cylinder, the faces 32, 33 and 34 on the clamp member 30, cooperate with the similar faces on the other clamp members to engage the corresponding mounting surfaces 13*d*, 13*e*, 13*f*, 13*g*, 13*h* and 13*i* to secure the die plate against any movement longitudinally or circumferentially. For example, mounting face 33 in the clamp member 30 secures the die plate 13*a* against movement circumferentially while the mounting faces 32 and 34 secure the die plate against movement longitudinally with respect to the rotary cylinder.

Adjustable dies mounted on rotary cylinders may be used to perform other fabricating operations on cardboard sheets than providing corners for cardboard boxes. Referring to FIG. 2, an adjustable die 40 is mounted onto the rotary cylinder by clamp members 41 and 42 in order to cut a hole 43 in the cardboard sheet C. The adjustable die 40 includes a die plate 40*a* which has a circular blade 40*b* mounted thereon in order to actually cut the hole 43. The clamp members 41 and 42 are identical to the clamp member 30 and, the die plate 40*a* is offset with mounting surfaces similar to the mounting surfaces 13*d*, 13*e* and 13*f* on the die plate 13*a* so that the clamp members 41 and 42 can be mounted on the rotary cylinder against the die plate 40*a*. The clamp members 41 and 42 thereby allow the position of the die plate 40*a* to be adjusted both longitudinally and circumferentially on the rotary cylinder to any position desired. And, the position of the die plate 40*a* to be adjusted even distances which are only a fraction of the distance between the adjacent circumferentially spaced holes or adjacent longitudinally spaced holes in the rotary cylinder.

Sometimes it is necessary to mount a die 50 near an end 15*a* of the rotary cylinder. Since the edge 50*a* of the die plate 50*b* for the die is quite close to the end 15*a*, it is not desirable to mount clamp members such as the clamp members 30 at the die plate edge 50*a* since they would extend over the end 15*a* of the rotary cylinder and thereby interfere with the operation of the cardboard box fabricating machine. In this situation a rectangular aperture 50*c* may be cut in the die 50 and, mounting surfaces 51, 52 and 53 may be offset on one side of the aperture and mounting surfaces 54, 55 and 56 may be offset on the other side. In order to adjust the die 50 both longitudinally and circumferentially distances which are a fraction of the distance between adjacent holes, a clamp member 60, which is shown in detail in FIG. 6, may be mounted in the aperture 50*c* against the mounting surfaces of the die plate 50*b*. The clamp member 60 is substantially similar to the clamp member 30 already discussed except that the clamp member 60 has mounting faces machined at both ends 60*a* and 60*b*.

A elongated slot 60*c* is cut in the clamp member, and a bolt 61 is mounted in the slot with the bolt head 61*a* engaging recessed surface 60*d* in the slot when the clamp member is secured against the rotary cylinder. At the end 60*a* of the clamp member, the lamp member mounting faces 62, 63 and 64 are adapted to engage the corresponding die plate mounting surfaces 53, 52 and 51, respectively. Similarly, the clamp member mounting surfaces 65, 66 and 67 at the end 60*b* of the clamp member are adapted to engage the corresponding die plate mounting surfaces 56, 55 and 54 in the aperture 50*c*. A threaded nut 68 is mounted for threaded engagement in a hole 69 extending through the mounting face 66 of the clamp member to engage the corresponding die plate mounting surface 55 and, a similar nut 70 is threadably mounted in a hole 71 and may be rotated into engagement with the corresponding surface 52 in the aperture 50*c*.

With the bolt 61 loosened out of engagement with the clamp member 60, the die plate 50 is adjustable both longitudinally and circumferentially even distances less than the distances between adjacent holes similar to the other adjustable die discussed herein.

Of course, it is to be understood that the configuration of the cutting blades and scoring blades discussed herein and their relative positions on the die plates and the cardboard sheet C are merely a simple illustration of the styles of boxes that may be fabricated. It is to be understood that any form of box including open ended and closed boxes may be fabricated. For example, it is within the scope of this invention to provide adjustable

"one piece folder dies" and "five piece folder dies" for making enclosed boxes.

In the preferred embodiments discussed herein the series or system of four adjustable dies **10, 11, 12** and **13** have been described for fabricating a box from the cardboard sheet C shown in the drawing. Also, the single adjustable die **40** has been described for cutting a hole in the cardboard sheet C. It is to be understood that the number of dies used in fabricating a box or in performing some other cutting or scoring operation on a cardboard sheet such as cutting a hole therein may include any numbers of dies; but, the inventive concepts disclosed herein are applicable to those systems also.

The sheet C discussed herein was described as being made of cardboard, it is to be understood that the same fabrication principles may be applied to any other material that on which arcuate dies can be used.

Also in the preferred embodiment of the adjustable dies **10, 11, 12** and **13,** the depth of the box, that is, the distance from the line of indentation **16** to the edge **16*a*** of the cardboard sheet C is constant since it is determined by the position of the cutting and scoring blades which are mounted on the dies themselves. Certainly, in embodiments of this invention, even the depth of the boxes produced may be adjustable.

I claim:

1. An adjustable die adapted to be mounted on a rotary cylinder of a box fabricating machine wherein said rotary cylinder has a plurality of holes which are evenly spaced longitudinally and circumferentially of said cylinder comprising:

a. an arcuate die plate adapted to be mounted on said rotary cylinder;

b. an adjustable clamp member engaging said die plate on said rotary cylinder;

c. said adjustable clamp member including longitudinal means for adjusting the position of said die plate longitudinally a fraction of the distance between said longitudinally spaced holes in said rotary cylinder; and

d. said adjustable clamp member further including circumferenital means for adjusting the position of said die plate circumferentially on said rotary cylinder a fraction of the distance between the circumferentially spaced holes whereby the position of said die is adjustable in fractions of the distances between holes spaced both longitudinally and circumferentially of said rotary cylinder.

2. The structure set forth in claim **1** wherein said longitudinal means include:

a. a substantially elongated slot in said clamp member which extends in a substantially longitudinal direction with respect to said rotary cylinder;

b. a clamp member mounting means extending through said elongated slot into engagement with said rotary cylinder for mounting said clamp member onto said rotary cylinder.

3. The structure set forth in claim **1** wherein said circumferential means includes:

a. a mounting face on said clamp member engaging said die plate; and

b. a clamp member mounting means extending through said clamp member into engagement with said rotary cylinder for mounting said clamp member on said rotary cylinder.

4. The structure set forth in claim **2** wherein said clamp member mounting means includes:

a bolt extending through said slot and threadedly engaging a hole in said rotary cylinder.

5. The structure set forth in claim **3** wherein said clamp member mounting means includes:

a bolt extending through said clamp member and threadedly engaging a hole in said rotary cylinder.

6. The structure set forth in claim **3** including:

a threaded means extending through a threaded hole in said mounting face into engagement with said die plate in order to further secure said die plate on said rotary cylinder.

7. The structure set forth in claim **3** wherein said longitudinal means includes:

a second mounting face engaging said die plate, said second mounting face being substantially perpendicular to said first-mentioned mounting face engaging said die plate.

8. A plurality of dies mounted on a rotary cylinder of a box fabricating machine wherein said rotary cylinder has a plurality of holes which are evenly spaced longitudinally and circumferentially of said cylinder, comprising:

a. a first arcuate die plate adapted for mounting on said rotary cylinder;

b. first die means mounting said first die plate on said rotary cylinder;

c. a second arcuate die plate adapted for mounting on said rotary cylinder;

d. second die means for mounting and adjusting the position of said second die plate longitudinally a fraction of the distance between longitudinally spaced holes in said rotary cylinder;

e. a third arcuate die plate mounted on said cylinder;

f. third die means for mounting and adjusting the position of said third die plate in a circumferential direction with respect to said first die plate a fraction of the distance between circumferentially spaced holes;

g. a fourth arcuate die plate mounted on said rotary cylinder; and

h. an adjustable clamp member engaging said fourth die plate and including fourth die plate longitudinal means for adjusting the position of said fourth die plate a fraction of the distance between said longitudinally spaced holes along the longitudinal axis of said rotary cylinder whereby one dimension of a box may be varied by a distance less than the distance between said longitudinally spaced holes; and

i. said adjustable clamp member further including fourth die plate circumferential means for adjusting the position of said fourth die plate in a circumferential direction about said rotary cylinder a fraction of the distance between said circumferentially spaced holes whereby another dimension of a box may be varied by a distance less than the distance between said circumferentially spaced holes so that various sizes of boxes may be fabricated.

9. The structure set forth in claim **8** wherein said second die means includes:

a. an elongated slot in said second die plate extending longitudinally of said rotary cylinder; and

b. a second die plate mounting means extending through said elongated slot for engaging said second die plate in order to secure said second die

plate on said rotary cylinder, said second die plate mounting means being movable out of engagement with said second die plate such that the position of said second die plate is adjustable longitudinally to a fraction of the distance between longitudinally spaced holes in said rotary cylinder with respect to said first die plate.

10. The structure set forth in claim **9** including:

an elongated washer mounted in said longitudinally extending slot whereby said mounting means extends through said slot for engaging said washer in order to secure said second die plate.

11. The structure set forth in claim **8** wherein said third die means includes:

a. an elongated slot extending circumferentially in said third die plate; and

b. a third die plate mounting means extending through said slot for engaging said third die plate in order to secure said third die plate on said rotary cylinder, said third plate mounting means being movable out of engagement with said third die plate such that the position of said third die plate is adjustable circumferentially to a fraction of the distance between circumferentially spaced holes of said rotary cylinder with respect to said first die plate.

12. The strucutre set forth in claim **11** including:

an elongated washer mounted in said circumferentially extending slot whereby said third die plate mounting means extends through said slot for engaging said washer in order to secure said third die plate.

13. The structure set forth in claim **8** wherein said fourth die longitudinal means includes:

a. a substantially elongated slot in said clamp member; and

b. a clamp member longitudinal mounting means extending through said elongated slot into engagement with said rotary cylinder for mounting said clamp member on said rotary cylinder, said clamp member mounting means being movable between a first position where said clamp member and fourth die plate are movable longitudinally of said rotary cylinder a fraction of the distance between longitudinally spaced holes in said rotary cylinder and a second position where said clamp member mounting means secures said clamp member and fourth die plate to said rotary cylinder.

14. The structure set forth in claim **8** wherein said fourth die circumferential means includes:

a. said clamp member having a mounting face for engaging and securing said fourth die plate on said rotary cylinder; and

b. a clamp member circumferential mounting means extending through said clamp member into engagement with said rotary cylinder for securing said mounting face against said fourth die plate, said clamp member mounting means being movable between a first position where the position of said fourth die plate is circumferentially adjustable a fraction of the distance between circumferentially spaced holes in said rotary cylinder and a second position where said clamp member mounting means secures said mouting face against said fourth die plate.

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