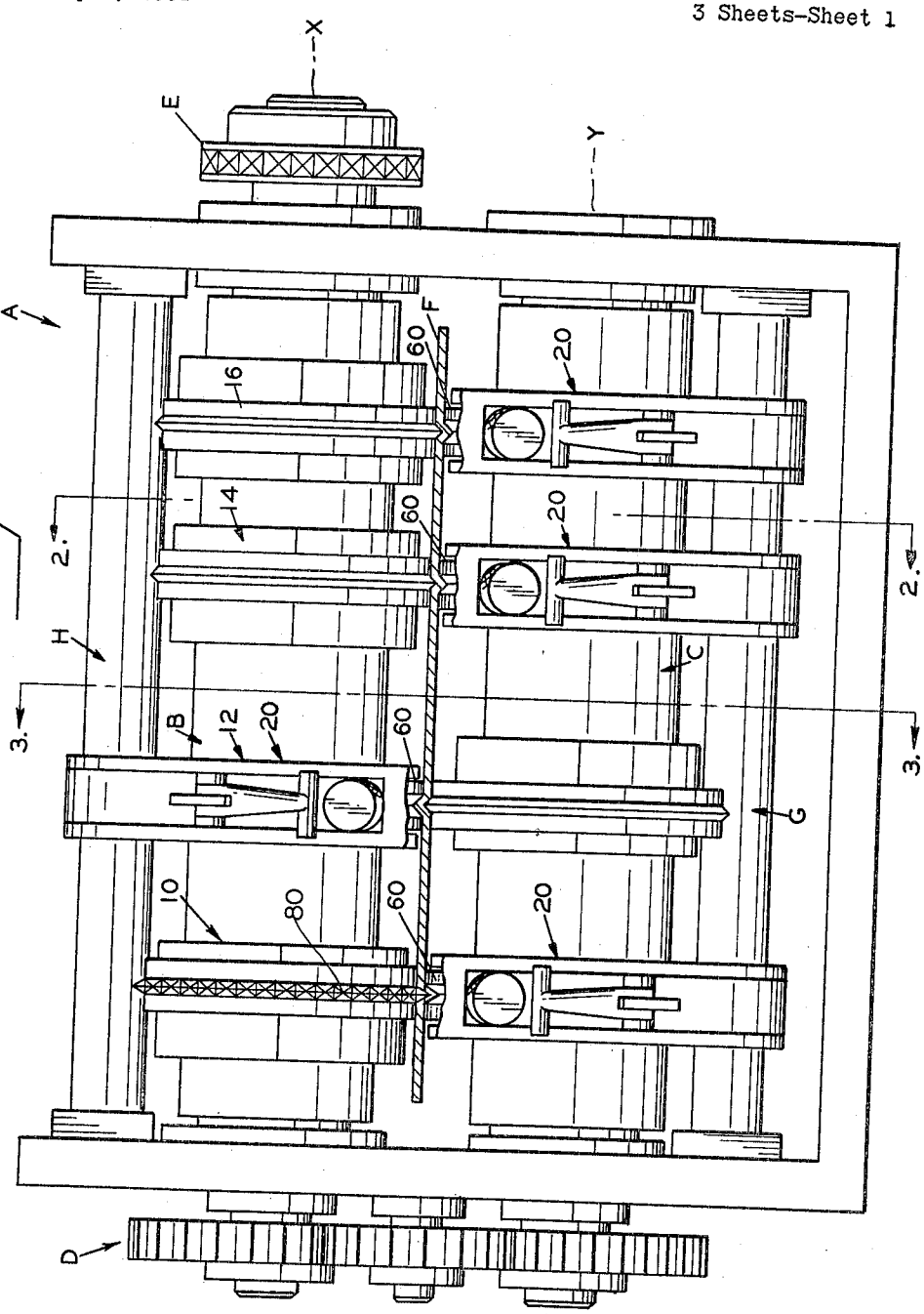
Jan. 27, 1970 N. E. DOVEY 3,491,632

ATTACHMENT FOR ROTARY CARDBOARD CUTTING MACHINE

Filed May 2, 1968 3 Sheets-Sheet 1

Fig. 1.



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Fig. 3.

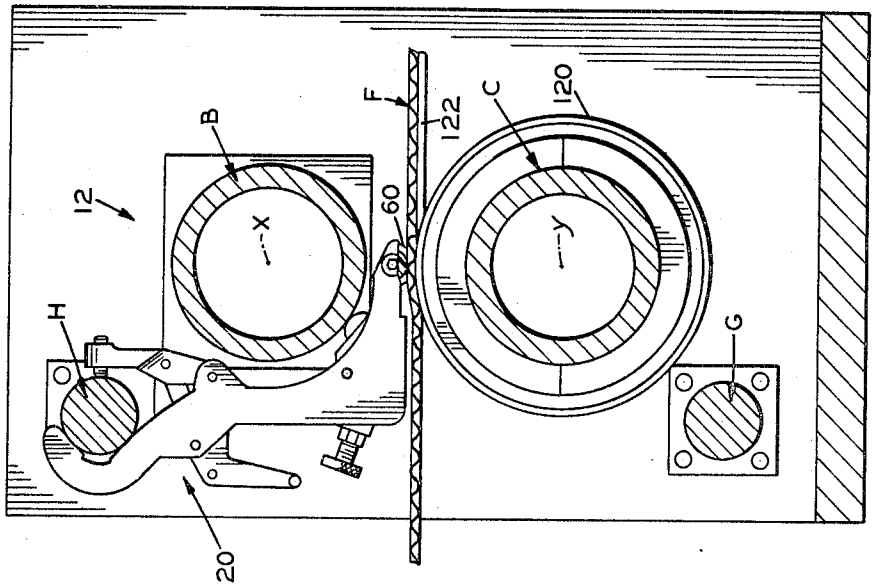
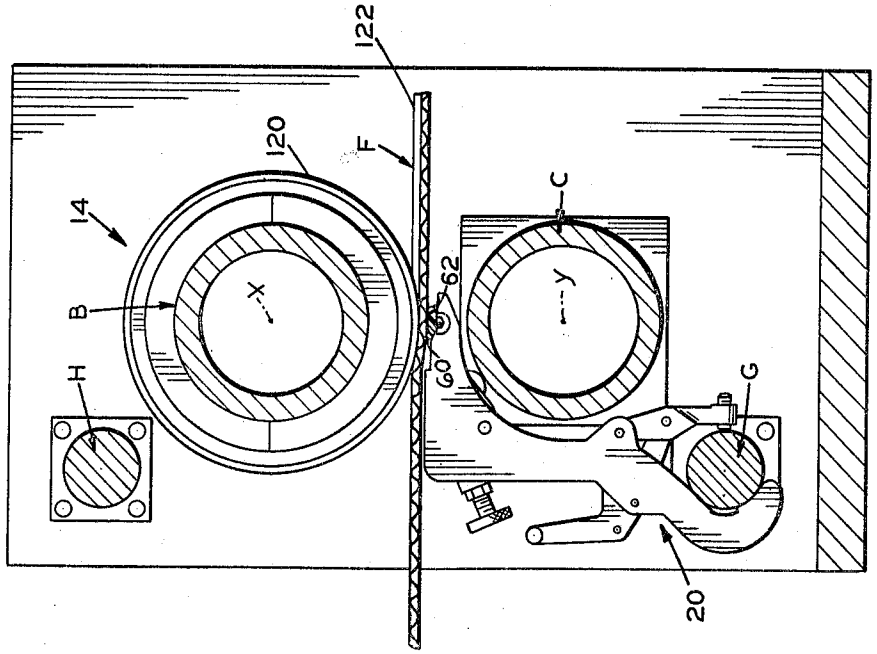


Fig. 2.



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Fig. 5

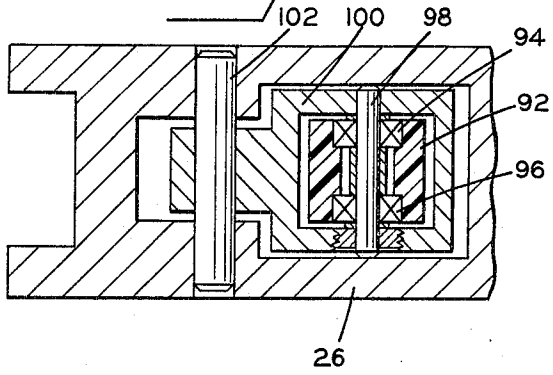


Fig. 7

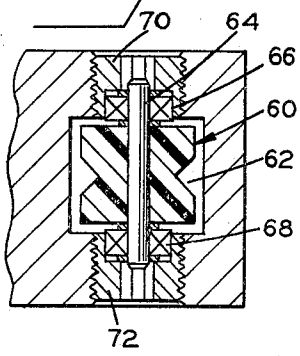
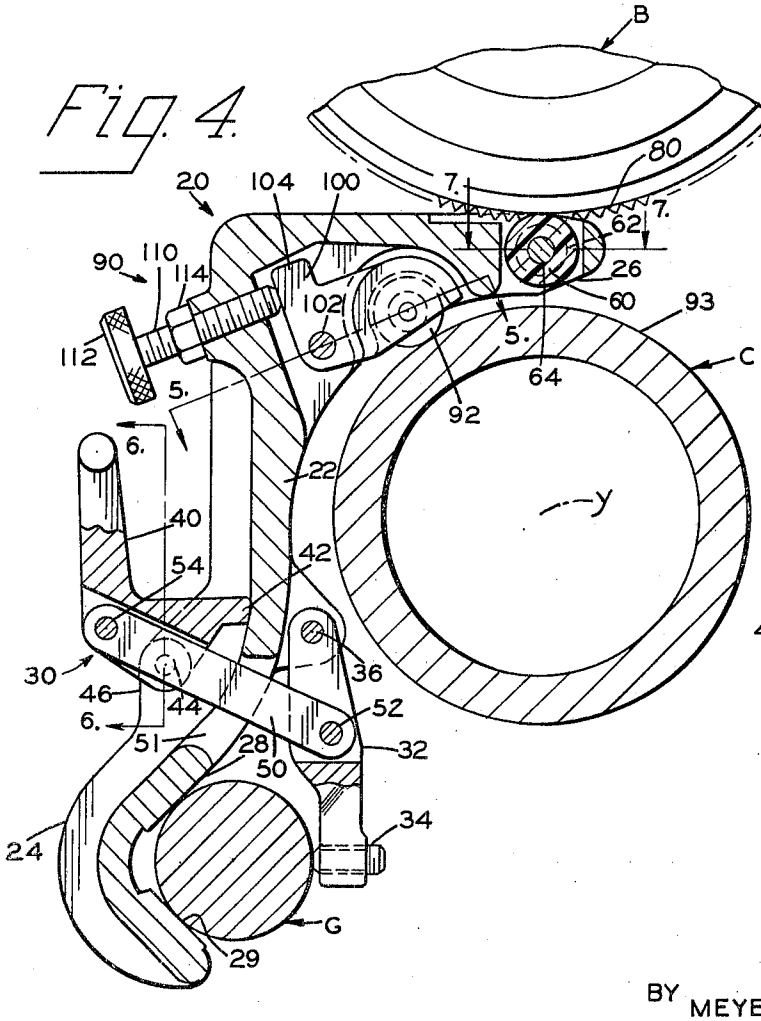


Fig. 4



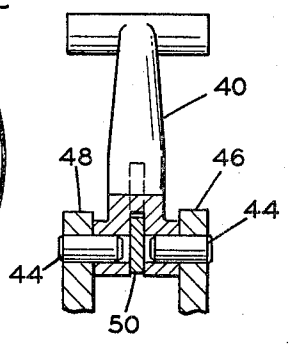


Fig. 6.

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Patented Jan. 27, 1970

3,491,632

ATTACHMENT FOR ROTARY CARDBOARD CUTTING MACHINE

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Continuation-in-part of application Ser. No. 499,720, Oct. 21, 1965. This application May 2, 1968, Ser. No. 726,185

Int. Cl. B26d 1/22

U.S. Cl. 83—11 9 Claims

ABSTRACT OF THE DISCLOSURE

There is provided an attachment for a rotary cardboard slitting or creasing device of the type including spaced, parallel shafts between which the cardboard passes. The attachment includes a body with a leg for mounting an anvil adjacent a cutting or creasing blade on one shaft and for mounting a roller which rides on the other shaft. By adjusting the relative position of the anvil and roller the position of the anvil with respect to the blade can be changed.

DISCLOSURE

The present invention is a continuation-in-part application of my copending application Ser. No. 499,720 filed Oct. 21, 1965, now Patent No. 3,386,323.

The present invention relates to the art of cutting cardboard and similar sheet material as it is moving along a predetermined path and more particularly to an attachment for a slitter of the type used in cutting or creasing fibrous sheet material.

This invention is particularly applicable to an attachment for use with a two-shaft slitter, and will be described with particular reference thereto; however, it will be appreciated that the invention has broader applications and may be used as an attachment for various rotary cutting device wherein cardboard, or other sheet material, is conveyed between two rotary shafts having matching, cutting or creasing implements mounted thereon for cutting or creasing the moving cardboard.

It has become somewhat common practice to provide cardboard or corrugated board blanks from a continuous sheet passing through a slitter. A slitter, as is well known, generally includes two vertically spaced, generally parallel rotating shafts. Matching accessories are mounted onto the spaced shafts in axial alignment with each other so that the board will be processed as it passes between the shafts. These matching accessories can take the form of cutting tools, which slit the cardboard longitudinally, score rolls which form longitudinally extending indentations or creases, generally known as scores, or perforating members, which perforate the cardboard longitudinally so that it may be folded along the perforations.

The installation of accessories onto the two spaced shafts has certain disadvantages. For instance, when the spaced shafts are utilized for a plurality of cutting, creasing and scoring operations, the spacing between the shafts cannot be adjusted to an optimum spacing for each of the separate operations. In addition, these accessories require accurate adjustment of rotary members on each of the spaced shafts which can be acomplished only by adjusting the spacing of the shafts. Since the two shafts are driven somewhat complex, gearing is required to allow vertical adjustment of the spacing between the shafts without affecting the driving connections to these shafts. Consequently, the accessories utilized on the two shafts require accurate dimensioning to provide optimum operation; and during continuous use, minor adjustments are not easily

made for readjusting the various accessories to their optimum operating conditions. This difficulty is compounded when a substantial number of separate operations are to be performed on a given set of shafts.

My prior patent application Ser. No. 499,720 filed Oct. 21, 1965, provided accessory for a rotary, cutting or creasing device which would overcome some of the abovementioned disadvantages. In acordance with the invention disclosed and claimed in that application, a separate attachment was utilized for providing a small plastic anvil against which a circular blade on a single shaft would bear. This prior attachment has proven quite satisfactory; however, certain difficulties have been experienced. An arm extending between the shafts of the processing machine was used to carry the plastic anvil; however, this arm could not be adjusted in any manner and could be deflected during use. Consequently, certain difficulties were experienced in the use of this initial attachment for providing an auxiliary anvil to be used in a cardboard cutting or creasing machine.

In accordance with the present invention, the disadvantages experienced in utilizing my prior attachment have been completely overcome by providing an attachment which is more versatile and provides more uniform operating conditions.

In accordnace with the present invention, there is provided an attachment for use on a rotary cutting and creasing machine for the type used to process cardboard. This attachment includes a body portion with an outwardly extending leg and a mounting portion, means adjacent the mounting portion for releasably securing the body portion on to a juxtapositioned mounting shaft, and a leg extending between the vertically spaced shafts. A generally cylindrical anvil element is rotatably mounted on a first axis generally parallel to the shafts of the machine and a support element adapted to abut one shaft of the machine are both mounted onto the arm of the attachment. Means are provided for adjusting the relative positions of the anvil elements and the support element to, in this manner, change the vertical position of the anvil with respect to a cutting blade mounted on the other shaft. In this manner, the anvil is braced against deflection by the support elements riding one one of the shafts. In addition, the position of the anvil with respect to the blade utilized in processing the cardboard can be easily adjusted to provide optimum cutting clearance, irrespective of the adjustment of various other attachments located adjacent and between the same two spaced rotating shafts.

The primary object of the present invention is the provision of an attachment for a rotary cutting or creasing device that is used to support a small anvil adjacent a processing blade on one of two spaced, rotating shafts, which attachment is economical to produce, easy to install, rigid in operation, and allows adjustment of the anvil with respect to the blade.

In accordance with another object of the present invention, there is provided an attachment, as defined above, which includes means for bracing the attachment on the shaft opposite the shaft having the blade.

Yet another object of the present invention is the provision of an attachment, as defined above, which includes a means for vertically adjusting the anvil with respect to the blade without affecting the bracing of the attachment on the second shaft.

These and other objects and advantages will become apparent from the following description used to illustrate the preferred embodiment of the present invention as read in connection with the accompanying drawings in which:

FIGURE 1 is a front elevational view showing, somewhat schematically, the preferred embodiment of the present invention and its environment;

FIGURE 2 is a cross-sectional view taken generally along line 2—2 of FIGURE 1;

FIGURE 3 is a cross-sectional view taken generally along line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged view illustrated in the preferred embodiment of the persent invention;

FIGURE 5 is an enlarged cross-sectional view taken generally along line 5—5 of FIGURE 4;

FIGURE 6 is a partial cross-sectional view taken generally along line 6—6 of FIGURE 4; and,

FIGURE 7 is an enlarged cross-sectional view taken generally along line 7—7 of FIGURE 4.

Referring now to the drawings wherein the showings are for the purpose of illustrating a preferred embodiment of the invention only and not for the purpose of limiting the same, FIGURE 1 shows a slitter A having two parallel, vertically spaced shafts B, C, journalled to rotate about axes *x, y*, respectively. It is appreciated that only one set of vertically spaced shafts are shown; however, in practice two or more sets may be used. The shafts are interconnected by a gear train D and are driven by an appropriate means, such as a drive chain E, so that the two shafts rotate in opposite directions and at substantially the same speed. A sheet of carboard F, either corrugated or uncorrugated, passes between the rotating shafts B, C. In the past, one processing blade, such as a cutting blade or scoring blade, was concentrically mounted with respect to one shaft and a corresponding blade was concentrically mounted with respect to the other shaft. These two blades would coact to provide a slit, a line of perforations, a score or other longitudinally extending modifications to the cradboard sheet F. In accordance with the persent invention, as will be explained later, only one processing blade is provided concentric with a machine shaft and an attachment is used to provide the coacting member which generates the longitudinal modification in the moving sheet. Slitter A is also provided with a lower mounting shaft G and an upper mounting shaft H which shafts are stationary and are secured in a position generally parallel with the axes of the rotating shafts B, C. As illustrated, the plurality of operations are performed upon sheet F at transversely spaced positions generally designated stations **10**, **12**, **14**, and **16**. Station **10** is used to slit or perforate the sheet F, whereas stations **12**, **14**, and **16** are used to provide longitudinally extending scores in the sheet F. If the blades used in processing are discontinued, the slit, perforations, or scores can have a finite length; otherwise, they have an indefinite length corresponding to the length of the sheet F.

Referring now more particularly to station **10** as shown in FIGURES 4–7, an attachment **20** is provided at this particular station. The same general attachment is provided at the other stations; however, station **10** is used for splitting or perforating, and the other stations are illustrated as being used for scoring. A particular use does not substantially change the structure of the attachment **20**; therefore, a discussion of the attachment **20** at station **10** will apply equally to the attachment **20** at the other stations.

Attachment **20** includes a generally unitary body **22** having a mounting portion **24** at one end and an outwardly extending leg **26** at the other end. The leg extends between the shafts B, C, and the mounting portion **24** includes angled bearing surfaces **28**, **29** adapted to bear against the outer surface of one of the mounting shafts, such as shaft G. Adjacent the mounting portion **24**, there is provided a toggle clamping mechanism **30** having a lever **32** with an adjustable stud **34** adapted to contact the mounting shaft and a pivot pin **36** to allow a swinging action for lever **32**. An operating handle **40** has an abutment **42** adapted to limit clockwise movement of the handle with respect to a pivot pin **44** secured between ears **46**, **48** integrally formed with respect to body **22**. Handle **40** is connected with lever **32** by a toggle link **50** extending through an opening **51** in body **22**. A pin **52** connects the link with lever **32**, while a pin **54** connects the link with the handle **40**. Pin **54** is so positioned to move over-center of pin **44** to clamp stud **34** against the outer surface of shaft G. This secures the attachment **20** with respect to the mounting shaft. A simple movement of the handle **40** in a counter-clockwise direction releases the attachment **20** so that it may be either removed from the shaft G, rotated about the shaft, or moved axially along the shaft to align the attachment with respect to a processing blade on shaft B, which blade will be described later.

Referring now to the leg **26** of attachment **20**, this leg rotatably mounts a plastic anvil **60** having a peripherally extending groove **62**. The anvil is secured onto a shaft **64**, best shown in FIGURE 7. This shaft is in turn journalled within bearings **66**, **68** supported within threaded journal supports **70**, **72** respectively. The groove **62** allows entry of the teeth on the outer periphery of a serrated blade **80**. If the anvil **60** is moved upwardly toward blade **80**, a sufficient amount, the serrated blade **80** will slit cardboard sheet F as it passes between the blade **80** and anvil **60**. If the anvil is moved away from the blade **80**, the teeth on the blade will extend only part way through the sheet F to provide perforations. The adjustment of the anvil **60** with respect to the blade **80** may be made without changing the vertical spacing of the shafts B, C, which would affect the operation of various other processes being performed on the sheet by other blades and attachments.

Referring now to the means whereby the anvil **60** is adjusted with respect to the blade **80**, there is provided an adjustment mechanism **90** having a plastic roller **92** bearing against the outer surface **93** of shaft C. This roller is journalled by bearings **94**, **96** upon a shaft **98** extending in a direction generally parallel to the axes *x, y* of the shafts B, C. The shaft **98** is secured on a lever **100** having a pivot pin **102** carried by body **22** and an outwardly extending arm **104**. An adjusting bolt **110** having an enlarged head **112** is adapted to force the lever **100** in a clockwise direction. This in turn moves the anvil **60** upwardly with respect to serrated blade **80**. At the same time, attachment **100** may rotate slightly about mounting shaft G. To secure the lever **100** in its proper position, the adjusting bolt **110** is locked in placed by a nut **114**. To reset the anvil **60**, nut **114** is loosened and bolt **110** is adjusted. Thereafter, it may be necessary to force manually the attachment **40** in a direction to bring the support roller **92** into engagement with surface **93**. During operation, the roller **92** rigidifies the attachment **20** so that the anvil maintains a preselected spacing with respect to blade **80** during the complete run of the slitter A. The bolt **112** may be used to change the position of anvil **60** so that the cardboard is slit or perforated, as required.

Referring now to FIGURE 2, station **14** does not differ substantially from station **10** except that blade **80** is replaced by a scoring blade **120**. This blade is received within the groove **62** of anvil **60** to provide a longitudinally extending score **122** in the sheet F. The same basic operation is performed at station **12**, shown in FIGURE 3. In this instance, the attachment **20** is secured onto the upper mounting shaft H so that the anvil **60** coacts with a scoring blade **120** mounted on roller shaft C. It is seen that the mounting shaft used for supporting attachment **20** is in the opposite side of the slitter A from the shaft used to mount the processing blade. This prevents interference between the attachment **20** and the moving sheet F.

Having thus described my invention, I claim:

1. An attachment for a rotary cutting and creasing machine of the type used to process cardboard and having at least one set of generally parallel, vertically spaced shafts between which said cardboard passes, one of said shafts being rotated about its axis and carrying a gen-

erally circular blade with a peripheral processing edge generally concentric with said axis, the other shaft having an outer surface and a mounting shaft generaly parallel with said spaced shafts, said attachment comprising: a body portion with an outward extending leg and a mounting portion, means adjacent said mounting portion for releasably securing said body portion onto said mounting shaft in a preselected axial position, said leg extending between said vertically spaced shafts, a generally cylindrical anvil element rotatably mounted on a first axis generally parallel to said shaft axis, a support element adapted to abut said surface of said other shaft, said elements being supported on said leg and means for adjusting the relative positions of said elements to change the vertical position of said anvil with respect to said edge.

2. An attachment as defined in claim 1 wherein said anvil is fixedly secured onto said leg and said adjusting means includes means for adjusting said support element with respect to said leg.

3. An attachment as defined in claim 1 wherein said other shaft is rotatable and said support element is cylindrical and rotatable about a second axis generally parallel with said shaft axis.

4. An attachment as defined in claim 1 wherein said mounting shaft is generally cylindrical and said body portion is radially adjustable on said mounting shaft by said securing means.

5. An attachment as defined in claim 1 wherein said support element is attached onto a lever pivotally

mounted onto said body portion and said adjusting means includes means for changing the position of said lever with respect to said body portion.

6. An attachment as defined in claim 1 wherein said other shaft is cylindrical and said support element is a roller riding on said other shaft.

7. An attachment as defined in claim 6 wherein said roller is rotatably mounted on a lever pivotally secured to said body and said adjusting means is a screw element coacting with said lever to force said lever away from said body to move said anvil with respect to said processing edge.

8. An attachment as defined in claim 7 wherein said mounting shaft is cylindrical and said securing means allows said body to rotate radially around said mounting shaft.

9. An attachment as defined in claim 1 wherein said mounting shaft is mounted on the opposite side of said other shaft than said one shaft.

References Cited

UNITED STATES PATENTS

904,247 11/1908 Cameron ---------- 83—482 X

JAMES M. MEISTER, Primary Examiner

U.S. Cl. X.R.

83—332, 470, 503; 93—58.2