United States Patent [19]

Peters

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[54] **PAPER TRIMMER**

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[73] Assignee: **Box Innards, Inc.,** Anaheim, Calif.

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[21] Appl. No.: **121,047**

[52] **U.S. Cl.** **83/441,** 83/428, 83/482, 83/498

[51] **Int. Cl.** **B26d 1/24**

[58] **Field of Search**.....83/373, 425, 428, 83/441, 482, 560, 498

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Primary Examiner—Frank T. Yost
Attorney—Edward D. O'Brian

[57] **ABSTRACT**

A paper trimmer for use in cutting a continuous strip of paper to a desired width as such a strip is conveyed along a path and occasionally moves tranversely to the path can be constructed utilizing a support extending transversely to the path, a carriage movably mounted on the support, guide means for engaging the strip and for conveying transverse motion of the strip to the carriage so as to move the carriage in accordance with such transverse motion and a cutter assembly mounted on the carriage for cutting the strip to a desired width as it moves along the path.

2 Claims, 5 Drawing Figures

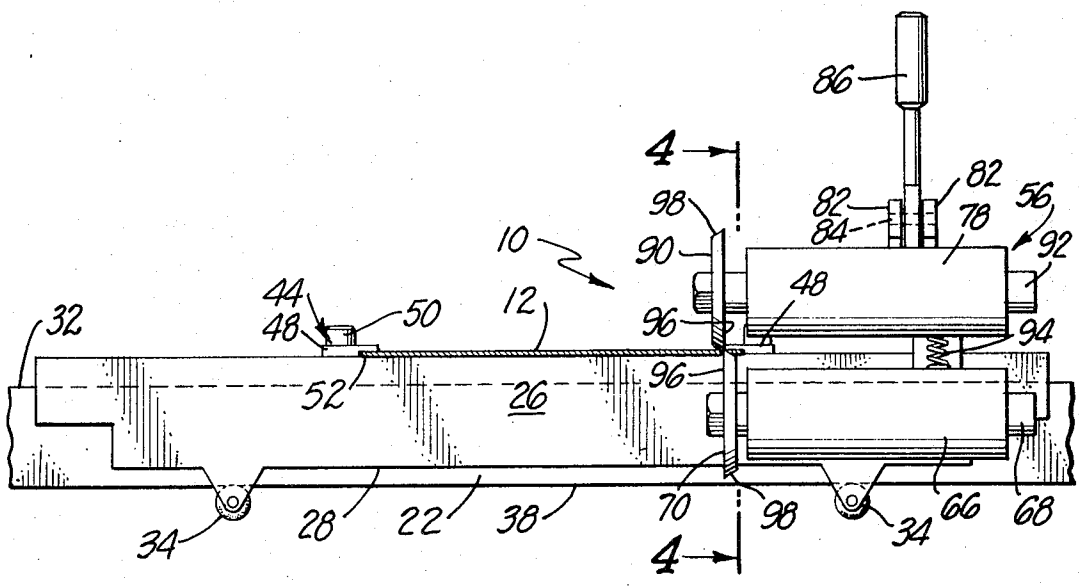


FIG. 1.

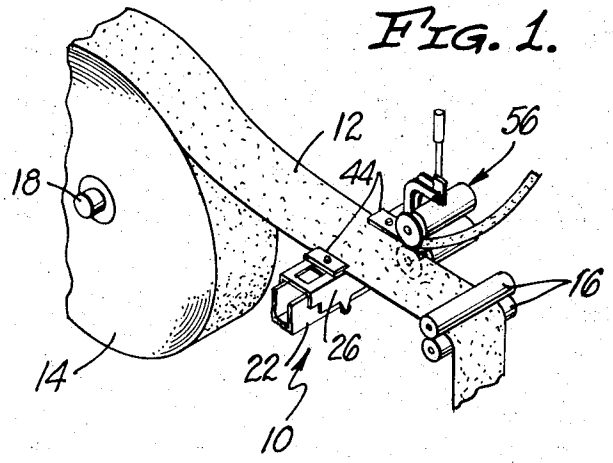
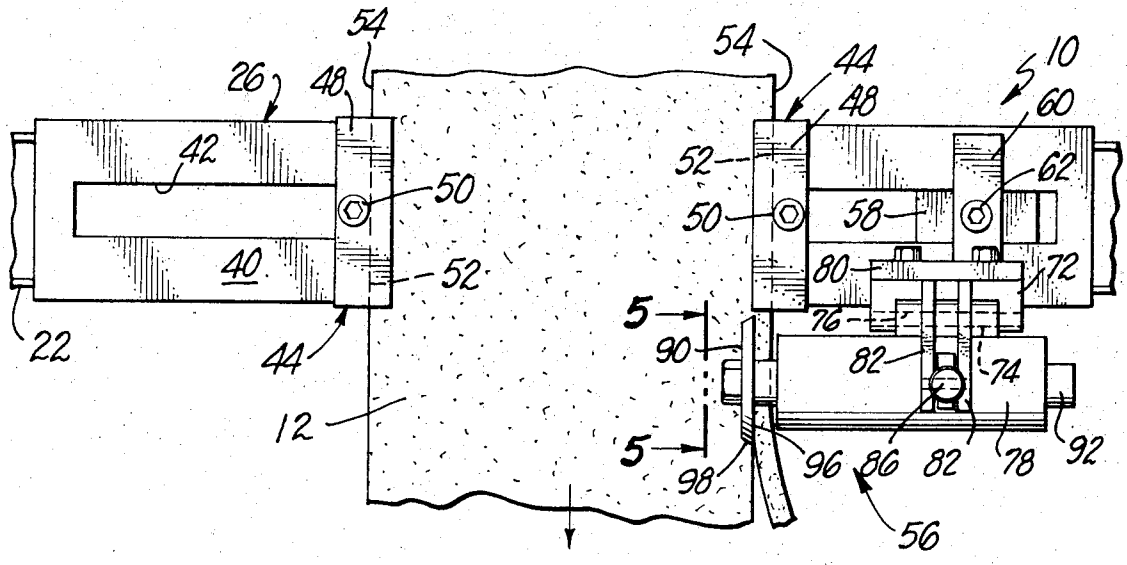


FIG. 2.



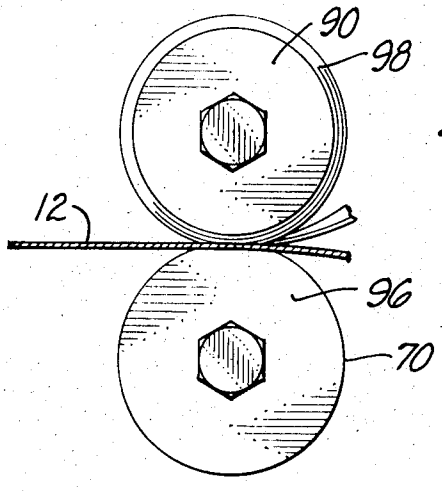


FIG. 5.

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FIG. 3.

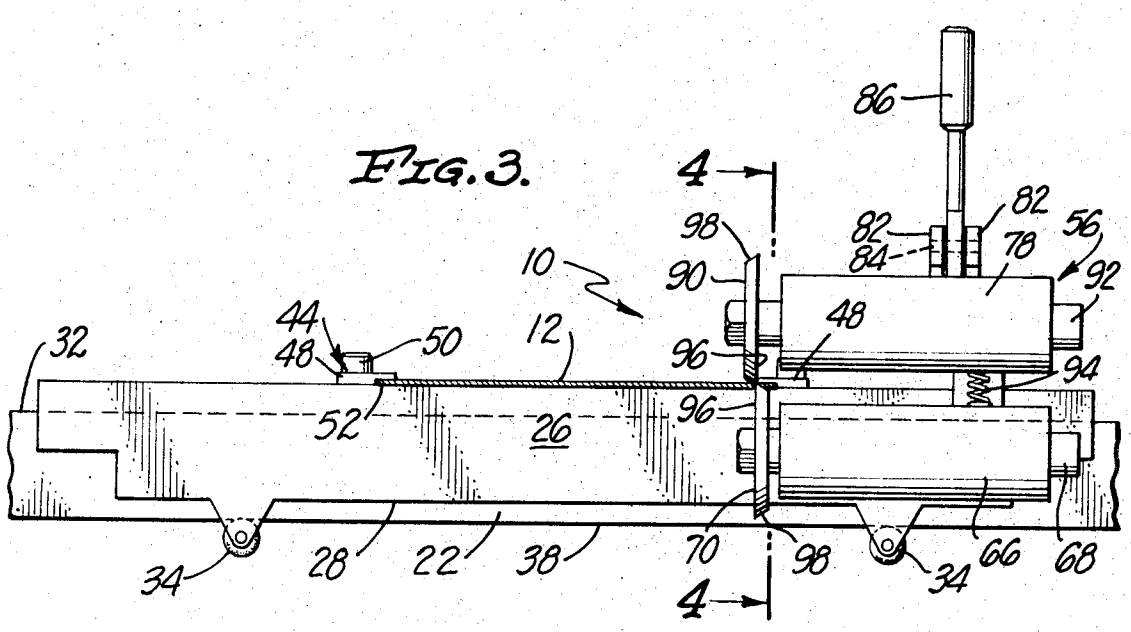
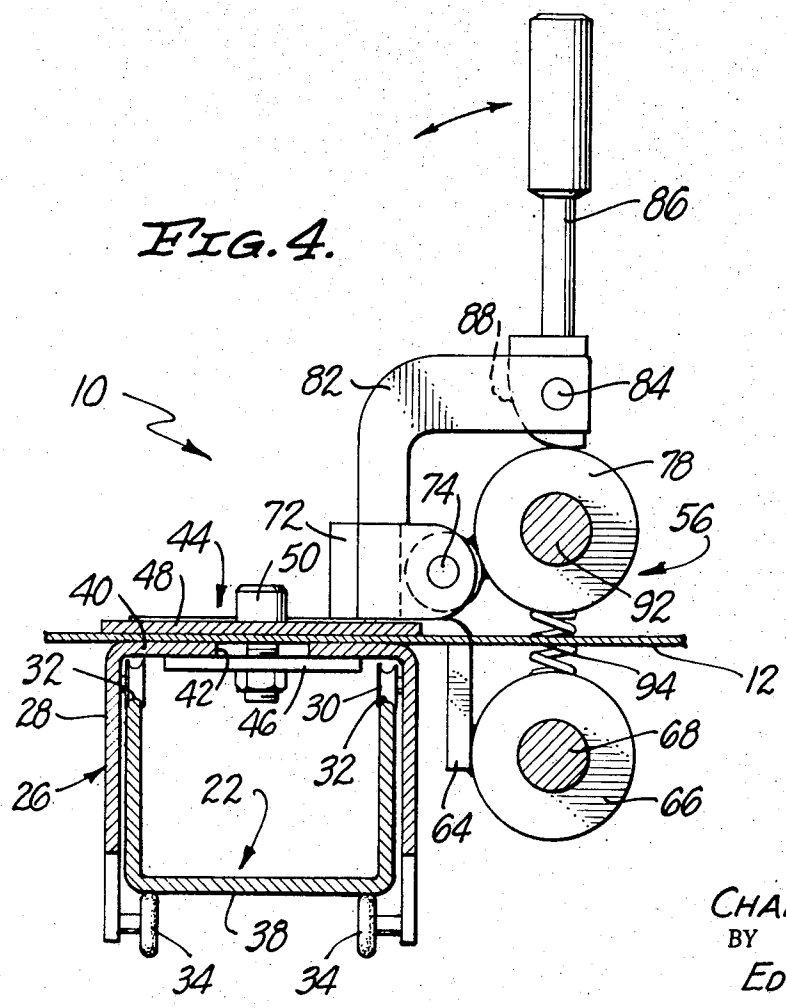


FIG. 4.



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PAPER TRIMMER

CROSS-REFERENCES TO RELATED APPLICATIONS

Charles L. Peters, U.S. patent application Ser. No. 68,616 filed Sept. 1, 1970 entitled, "Machine for Creating Divider Structures Such as are Used as Internal Partitions Within a Box".

BACKGROUND OF THE INVENTION

In the manufacture of divider structures such as are used as internal partitions to hold bottles within a box so that such bottles are separated from one another, the term "paper" is used to designate the nature of the material used in such internal partitions. The term "-board" is also used in substantially a synonymous manner to designate the material within such partitions. In a sense both of these terms are somewhat inaccurate or inappropriate as not completely indicating the characteristics or properties of a material as employed in such a partition.

A material as employed in such a partition should be relatively stiff and yet still should be sufficiently flexible so that it can be bent around a roller or the like as during manufacture. Such partitions are normally formed from strips of what may be referred to as cardboard or cardboard-like material. However, they may also be formed out of a material such as an expanded polystryne composition having physical properties related to the physical properties of cardboard. It is to be understood that the terms "paper" and "board" as employed in this specification and in the appended claims are utilized synonymously to designate any material having physical properties such as those indicated in this discussion.

Thus, these terms as used herein do not designate comparatively thin, non-self-supporting sheets or strips of material and do not designate sheets or strips of material which are so thick and inflexible in character that they cannot be handled as a flexible or somewhat flexible web or strip. To fall within the terms "paper" and "board" employed in this specification, a material must, when in strip form, be sufficiently stiff so as to be capable of being handled in such a way that during such handling it will not easily bend yet it must be sufficiently flexible so that it can be conveniently processed.

Such paper or board as employed in the manufacture of divider structures as indicated in the preceding and/or as employed for other purposes is commonly supplied by a manufacturer in the form of a comparatively large roll of a continuous strip of material. Such rolls are comparatively hard to handle. They are frequently of a greater width than may be desired for a particular manufacturing operation. Thus, for example, a roll of paper for use in a machine as disclosed in the aforenoted application, Ser. No. 68,616 may be undesirably wide for use in forming a member in an internal partition. When such an undesirable width is encountered it is necessary to trim the strip of paper contained in such a roll to a desired width.

As a continuous strip of paper is supplied from a large supply roll, the edges of such a strip of paper frequently are not in a desired precise alignment. Further as such a strip is supplied so that its moved or conveyed along a path it will frequently shift or move transversely to the path. Such lack of alignment and such movement make it difficult to satisfactorily trim a strip of paper to a desired width and such trimming has been a problem. Various means have of course been suggested in order to accomplish trimming as herein indicated. Included within such means are structures which have cut off both edges of a strip of paper as such a strip is moved along a path and moves transversely to the path.

SUMMARY OF THE INVENTION

An objective of the present invention is to provide a new and improved apparatus for use in cutting or trimming a continuous strip of paper to a desired width as such a strip is conveyed or moved along a path and as such a strip moves transversely relative to said path as the result of factors which are unimportant to the present invention. Further objectives of the present invention are to provide an apparatus for the purpose indicated: which is comparatively inexpensive; which is comparatively easy to use; which is comparatively effective for its intended purpose; and which is capable of giving prolonged, reliable, relatively maintenance-free performance.

In accordance with this invention, these and various other related objectives of the invention as will be apparent from a detailed consideration of the remainder of this specification are achieved by providing a paper trimmer for use as described which comprises: a support extending transversely of the path along which a strip of paper is conveyed or moved; a carriage movably mounted on the support so as to be capable of being moved along the length of the support between the ends of it during movement of the strip transversely to the path; two edge guide means for engaging the side edges of the strip during movement of the strip along the path, these edge guide means being mounted on the carriage so as to engage the side edges of the strip and transfer transverse motion of the strip relative to the path to the carriage so as to move the carriage as the strip moves transversely relative to the path; and a cutter assembly means for cutting the strip to a desired width as the strip moves along the path, the cutter assembly means being mounted on the carriage so as to engage and cut the strip as the strip moves away from the carriage.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is best more fully explained and described in connection with the accompanying drawings in which:

FIG. 1 is an isometric view showing the construction and use of a presently preferred embodiment or form of a paper trimmer in accordance with this invention;

FIG. 2 is a top plan view of the trimmer shown in FIG. 1;

FIG. 3 is a side elevational view of the paper trimmer shown in FIG. 1;

FIG. 4 is a cross-sectional view taken at line 4—4 of FIG. 3; and

FIG. 5 is a partial side elevational view taken at line 5—5 of FIG. 4.

It will be realized that the accompanying drawings are primarily intended to be used for explanatory purposes in explaining the construction and operation of a

presently preferred embodiment or form of a paper trimmer in accordance with this invention. The precise trimmer shown in the drawings is not the invention, but is only a specific unit embodying the essential concepts or features of the present invention as defined or summarized by the appended claims. These concepts or features can be easily embodied within other somewhat differently constructed trimmers or cutters through the use or exercise or of routine engineering skill.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT:

In the drawings there is shown a paper trimmer **10** in accordance with this invention used in cutting a continuous strip **12** of "paper" as this term is used herein to a desired width as such a strip **12** is conveyed along a path away from a conventional supply roll **14** through the operation of conventional powered feed rollers **16**. Such rollers **16** grasp or engage the strip **12** so as to pull it off the roll **14**, causing the roll **14** to rotate around a bar **18** serving as an axle. Usually the roll **14** will be provided with a central hub engaging this bar **18**. The bar **18**, the rollers **16**, and the trimmer **10** may be mounted so as to be supported on a framework (not shown). If desired, each may be mounted on a separate framework.

When mounted a support **22** forming a part of the trimmer **10** is held so as to extend horizontally transverse to the path of travel of the strip **12** caused by the operation of the rollers **16**. This support **22** preferably is an upwardly extending U-shaped channel of uniform cross-sectional configuration. This support **22** carries a carriage **26** in such a manner that this carriage **26** can be reciprocated or moved back and forth upon the support **22**. The carriage **26** itself preferably includes a downwardly extending U-shaped channel **28** fitting over the support **22**. This channel **28** carries a plurality of top support rollers **30** which engage the top edges **32** of the support **22**. It also includes or carries a plurality of bottom rollers **34** engaging the base **38** of the support **22**. The rollers **30** and **34** are used in sufficient number and are spaced sufficiently far from one another so that the carriage **26** can only be moved in a linear path transverse to the path of travel of the strip **12**.

The base **40** of the channel **38** is provided with a slot **42** extending in the direction of such travel. This slot **42** carries two edge guides **44** at a distance from one another corresponding to the width of the strip **12** prior to trimming. Each of these guides **44** includes a bottom plate **46**, a top plate **48** and a bolt **50** holding these plates **46** and **48** together on opposite sides of the base **40**. It will be noted that the top plates **48** are provided with over hung shoulders **52** effectively providing notches between the edge guides **34** and the carriage **26** which carry the initial side edges **54** of the strip **12**.

The paper trimmer **10** also includes a cutter assembly **56**. This assembly employs a bottom plate **58** which is operatively secured to a top plate **60** through another bolt **62**. The plate **60** carries a small bracket **64** which in turn supports a bearing **66** serving to hold a shaft **68** parallel to the direction of travel of the carriage **26** below the plane or surface of the base **40** of this carriage **26**. This shaft **68** rotatably supports a small disk-like cutting wheel **70** as shown.

In the cutter assembly **56**, the plate **60** also supports another bracket **72** which in turn supports a pin **74** extending parallel to the direction of travel of the carriage **26**. This pin **74** extends through a support hole **76** carried by another bearing **78** which in turn, extends parallel to the bearing **66**. The bracket **72** also carries an overhanging extension **80** having bifurcated arms **82** extending above the bearing **78**. A pin **84** extending between the arms **72** rotatably supports a latching handle **86** in such a manner that a cam surface **88** carried by the handle **86** can, by movement of the handle **86**, be forced against the bearing **78**. When the handle **86** is in a position as shown it serves to hold this bearing **78** in such a position that a disk-like cutting wheel **90** corresponding to the wheel **70** carried by a shaft **92** extending through the bearing **78** is positioned relative to the cutting wheel **70** as shown. In this operative or closed position, the bearing **78** is forced away from the bearing **66** up against the cam surface **88** by a small coil spring **94** biased between the two bearings **66** and **78**.

In this closed position the larger surfaces **96** of the wheels **70** and **90** overlap one another slightly as shown in FIG. **3** and are located in substantially the same plane. In this closed position the beveled edges **98** of these wheels **70** and **90** both lead to or are positioned with respect to the surfaces **96** so that the junctures of these surfaces **96** and the edges **98** will serve as cutting edges. When the wheels **70** and **90** are in this closed position, they engage the strip **12** so as to cut this strip **12** to a desired width corresponding to the placement of the wheels **70** and **90** relative to the edge guides **44**. The relative position between these edge guides **44** and of the cutter assembly **56** can of course be easily changed by loosening the bolts **50** and **62** and moving the edge guides **44** and the cutter assembly **56** to a desired location. This makes it possible to use the trimmer **10** with strips **14** of various widths and to trim the strips passing through the trimmer **10** to various desired extents.

It is believed that the manner in which the trimmer **10** is set up for use will be essentially obvious. With the handle **86** in an open position, the strip **12** will be inserted between the guide edges **44** and the cutting wheels **70** and **90** and will be inserted so as to pass between the feed rollers **16**. The handle **86** may then be returned to a vertical position as shown and the feed rollers **16** operated. During such operation the friction between the strip **12** and the wheels **70** and **90** will cause rotation of these wheels.

In the use of the trimmer **10** these edge guides **44** will engage the edges of the strip **12** in such a manner that the inherent physical characteristics or properties of the strip **12** will convey through the guides **44** to the carriage **26** any shifting of the strip **12** transverse to the path of this strip. As a consequence of this, the carriage **26** will be moved in accordance with any travel or movement of the strip **12** transverse to the normal direction or movement of the strip **12**, as a consequence or direct result of such movement.

During movement of the carriage **26** described, the cutter assembly **56** will of course move back and forth with the carriage **26** and will always remain at a fixed relative position with respect to the edge guides **44**. As a consequence of this, the strip **12** will be slit, cut or trimed to a desired fixed width as this strip **12** is pulled

through the paper trimmer **10** by the operation of the feed rollers **16**. Hence, these feed rollers **16** supply the power for the operation of the trimmer **10**. This is considered significant since these feed rollers **16** are normally required for other purposes than the operation of a paper trimmer **10** in an apparatus.

I claim:

1. A paper trimmer for use in cutting a continuous strip of paper to a desired width as such a strip is conveyed along a path and moves transversely relative to said path which comprises:

an elongated support extending transversely to said path,

a wheeled carriage movably mounted on said support so as to be capable of being reciprocated on its wheels along the length of said support between the ends thereof as said strip moves transversely relative to said path, said carriage having a top on which said strip of paper rests as it moves along said path,

two edge guide means for engaging the side edges of said strip during movement of said strip along said path, said edge guide means being mounted on said carriage so as to engage and overlie the side edges of said strip above said top in order to transfer transverse motion of said strip relative to said path to said carriage so as to move said carriage as said strip moves transversely relative to said path,

a cutter assembly means for cutting said strip as said strip moves along said path, said cutter assembly means being mounted on said carriage so as to engage and cut said strip as said strip moves away from said carriage.

2. A paper trimmer as claimed in claim **1** wherein:

said cutter assembly comprises coacting cutter wheels, one above and the other below said path,

said cutter wheels are flat, disk-like wheels having beveled peripheries and said cutter wheels are rotatably mounted in said assembly so that the largest sides of said wheels overlap one another,

one of said wheels is mounted so as to rotate in a fixed position relative to said carriage and the other of said wheels is movably mounted relative to said carriage so as to facilitate the use of said paper trimmer,

said cutter assembly includes cam clamp means for clamping said other of said wheels relative to said one of said wheels in an operative position.

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