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**Takashimagun Shiga (JP)**(54) **Sheet material trimming apparatus**

(57) An improved apparatus for trimming a sheet material assemblage along an edge thereof is provided. The apparatus has a table (11) for placing the sheet material assemblage (12) to be supplied thereon, and a knife (13) arranged above and oppositely to the table (11) for trimming the edge of said sheet material assemblage (12). A guide rod (17) is attached to the table (11) and an alignment block (15) is connected to the guide rod (17) for slide movement on the table (11). The position of the alignment block (15) is selectively fixed by a

screw (16). The sheet material assemblage (12) is abutted against the alignment block (15) at the opposite edge thereof so as to be positioned in a predetermined orientation relative to the knife (13) prior to trimming. The apparatus further has an ejection mechanism (21, 22, 23) for registering the sheet material assemblage (12) in the predetermined orientation as it is trimmed by the knife (13) and pushing out the sheet material assemblage (12) in the direction away from the alignment block (15) after trimming.

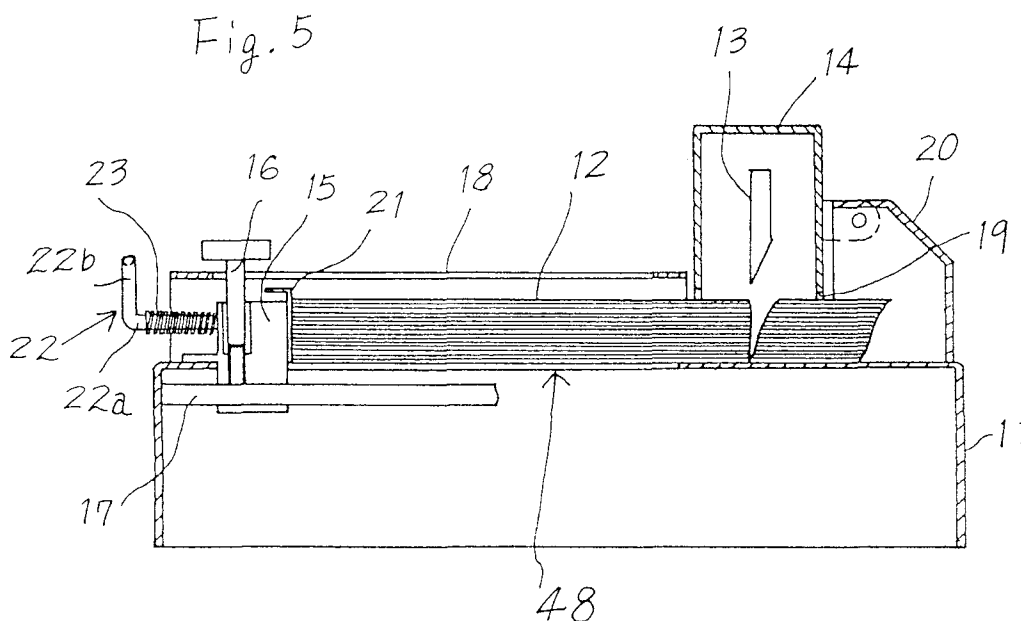
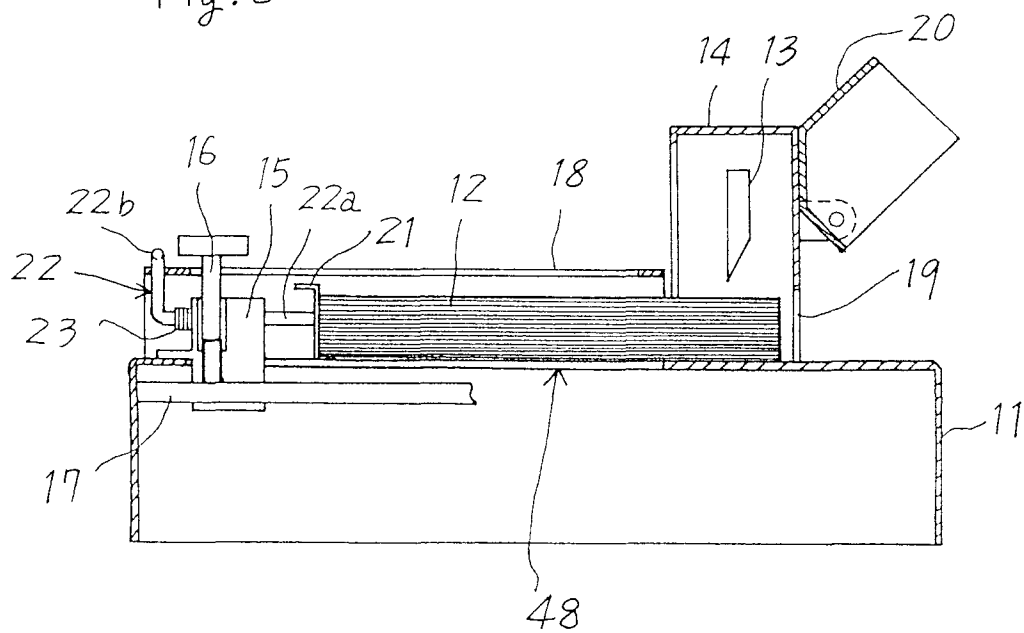
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Fig. 6



## Description

### BACKGROUND OF THE INVENTION

This invention relates to a sheet material trimming apparatus employed in a book binding process.

In the final step of a book binding process, a sheet material assemblage composed of a set of sheets stitched or bound together is trimmed along edges thereof. A small table top type trimmer is often employed for the trimming process.

Fig. 7 is a schematic front view of an example of such small table top type trimmer. Referring to Fig. 7, the numeral 11 designates a table for placing a sheet material assemblage 12 to be supplied thereon, and the numeral 13 designates a knife for trimming an edge of the sheet material assemblage and the numeral 14 designates a cover for the knife 13. A guide rod 17 is attached to the table 11 and an alignment block 15 is connected to the guide rod 17 for slide movement on the table 11. The alignment block 15 is locked at an arbitrary position by a screw 16. The numeral 18 designates a cover and the numeral 19 designates an opening for receiving or ejecting the sheet material assemblage 12.

The alignment block 15 extends parallel to the knife 13 and is moved along the guide rod 17 toward or away from the knife 13. Then the alignment block 15 is locked at the position corresponding to a predetermined size of the sheet material assemblage 12 by screwing the screw 16 into the guide rod 17. The sheet material assemblage 12 is held in precise position on the table 11 by abutting an edge thereof against the alignment block 15, so that the margin of the sheet material assemblage 12 is placed underneath the knife 13. The knife 13 is moved up and down by a drive mechanism (not shown) so as to trim the sheet material assemblage 12 along the edge thereof.

In the above-mentioned trimmer, it is necessary for an operator to get the sheet material assemblage 12 in and out through the opening 19. In this case, it is relatively easy to supply the sheet material assemblage 12 on the table 11 prior to trimming, since the margin of the sheet material assemblage 12 to be cut is placed outside the opening 19. On the contrary, the trimmed sheet material assemblage 12 is delivered by sliding the alignment block 15 toward the opening 19. Consequently, the position of the alignment block 15 should be adjusted each time the trimming is completed. Such delivery operation of the trimmed sheet material assemblage as well as adjustment operation of the alignment block is considerably troublesome.

In addition, for safety's sake, it recently become popular to arrange another cover at the outside of the opening 19 of the cover 14. Then the treatment of the trimmed sheet material assemblage is further troublesome.

### SUMMARY OF THE INVENTION

It is, therefore, an object of the invention to provide a trimmer which facilitates delivery of the trimmed sheet material assemblage by employing a simple mechanism.

According to the present invention there is provided an apparatus for trimming a sheet material assemblage along an edge thereof, the apparatus having a table for placing the sheet material assemblage to be supplied thereon, a knife arranged above and oppositely to the table for trimming the edge of the sheet material assemblage, a guide member attached to the table, and an alignment block connected to the guide member for slide movement on the table and means for selectively fixing the position of the alignment block. The sheet material assemblage is abutted against the alignment block at the opposite edge thereof so as to be positioned in a predetermined orientation relative to the knife prior to trimming. The apparatus further has ejection means for registering the sheet material assemblage in the predetermined orientation as it is trimmed by the knife and pushing out the sheet material assemblage in the direction away from the alignment block after trimming.

In accordance with a preferred embodiment, the ejection means comprises an auxiliary plate extending parallel to the alignment block and arranged between the alignment block and the sheet material assemblage. The sheet material assemblage is abutted against a surface of the auxiliary plate at the opposite edge thereof. The ejection means further comprises at least one actuating rod extending through the alignment block and arranged perpendicularly to the auxiliary plate for movement along its axis. One end of the actuating rod is connected to the opposite surface of the auxiliary plate, and a spring attached between the actuating rod and the alignment block in order to resiliently push the opposite surface of the auxiliary plate against the alignment block.

Accordingly, the present invention is advantageous in that the trimmed sheet material assemblage can be easily pushed out from the apparatus by means of the ejection means and the position of the alignment block need not be adjusted after trimming.

In the preferred embodiment, the ejection means has the very simple structure composed of the auxiliary plate, the actuating rod and the spring, and the trimmed sheet material assemblage can be easily ejected from the apparatus by pushing the actuating rod against the resilient force of the spring.

The other objects and features of this invention will become understood from the following description with reference to the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front view of a trimmer employing this invention;

Fig. 2 is a plan view of the trimmer shown in Fig. 1;  
 Fig. 3 is a left side view of the trimmer shown in Fig. 1;  
 Fig. 4 is a right side view of the trimmer shown in Fig. 1;  
 Fig. 5 is a side sectional view showing operation of the trimmer shown in Fig. 1;  
 Fig. 6 is a side sectional view showing operation of the trimmer shown in Fig. 1; and  
 Fig. 7 is a front view of a trimmer in the prior art.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In all of accompanying drawings, the same numerals designate the same structural elements. Referring to Figs. 1 to 4, the numeral 11 designates a table for placing a sheet material assemblage 12 to be supplied thereon, the sheet material assemblage 12 being composed of a set of sheets stitched or bound together. The numeral 13 designates a knife arranged above and oppositely to the table 11 for trimming an edge of the sheet material assemblage 12 and the numeral 14 designates a cover for the knife 13. A guide rod 17 is attached to the table 11 and an alignment block 15 is connected to the guide rod 17 for slide movement on the table 11. The alignment block 15 is fixed at an arbitrary position by fastening it with a screw 16. For the sake of facilitating operation, the screw 16 protrudes from a hole 47 formed on a rear cover 18. The numeral 19 designates an opening for receiving or ejecting the sheet material assemblage 12. A front cover 20 is provided with a pin 20a at each side thereof and attached to the cover 14 for swing movement about the pins 20a.

Two pairs of vertical guide members 41, 42 are fixed on the table 11 and arranged with a distance therebetween. The knife 13 is arranged between the vertical guide members 41 and 42 of each pair. Each of the guide members 42, 42 is provided with an oblique guide groove 43. As shown in Fig. 4, the guide grooves 43, 43 extend parallel to each other. The knife 13 is provided with rollers 44, 44 which are guided within the associated guide grooves 43, 43, respectively. The knife 13 is pivotally connected at its corner to a link 33 through a pivot 46 and the link 33 is pivotally connected to a crank 32 through a pivot 45. The crank 32 is coupled to a drive shaft of a motor 31 arranged within the table 11. Then the crank 32 is rotated by the drive of the motor 31, and the rotation of the crank 32 is transmitted to the knife 13 through the link 33, so that the knife 13 is moved upwardly and downwardly in an oblique direction in order to trim the sheet material assemblage 12 along an edge thereof.

An auxiliary plate 21 extends parallel to the alignment block 15 and is arranged between the alignment block 15 and the sheet material assemblage 12. Thus the sheet material assemblage 12 is abutted at the edge opposite to the edge to be trimmed against a surface of

the auxiliary plate 21 so as to be positioned in a predetermined orientation relative to the knife 13.

Two parallel leg portions 22a, 22a of a U-shaped actuating rod 22 extend through the alignment block 15 and are arranged perpendicularly to the auxiliary plate 21 for movement along their axes, respectively. The actuating rod 22 is connected at the tip of the leg portions 22a, 22a thereof to the auxiliary plate 21. The curved portion 22b of the actuating rod 22 is upwardly bent at right angle with the leg portions 22a, 22a and serves as a handle.

A spring 23 is arranged in surrounding each of leg portions 22a, 22a of the actuating rod 22 between the curved portion 22b and the alignment block 15 in order to resiliently push the opposite surface of the auxiliary plate 21 against the alignment block 15.

In case of trimming the sheet material assemblage 12 along an edge thereof, the screw 16 is loosened and the alignment block 15 is slid on the table 11 along the guide rod 17. When the alignment block 15 is reached the position according to a predetermined size of the sheet material assemblage 12, the alignment block 12 is fixed at the position by fastening it with the screw 16.

Then the front cover 20 is opened and the sheet material assemblage 12 to be trimmed is inserted into the apparatus through the opening 19 of the cover 14 until the sheet material assemblage 12 abuts at the opposite edge thereof against the auxiliary plate 21.

Thereafter, the front cover 20 is closed and the motor 31 is driven, and the knife 13 is downwardly moved in an oblique direction to trim the sheet material assemblage 12 along the edge thereof. Then the knife 13 is upwardly moved in the oblique direction and trimming operation is completed. This situation is illustrated in Fig. 5. The auxiliary plate 21 is pushed against the alignment block 15 by the resilient force of the spring 23 during trimming so that the sheet material assemblage 12 is positioned in the predetermined orientation as it is trimmed by the knife 13.

After trimming, the actuating rod 22 is manually pushed into the alignment block 15 against the resilient force of the spring 23 so as to push out the auxiliary plate 21 in a direction away from the alignment block 15, consequently, the sheet material assemblage 12 adjoining the auxiliary plate 21 is moved toward the opening 19 of the cover 14 until the trimmed edge of the sheet material assemblage 12 is pushed out beyond the knife 13. Then front cover 20 is opened, and the margin cut from the sheet material assemblage 12 is taken out. At this time, the trimmed edge of the sheet material assemblage 12 is pushed out beyond the knife 13. This situation is illustrated in Fig. 6. Thereafter, the auxiliary plate 21 is moved by the resilient force of the spring 23 to the position in which it adjoins the alignment block 15.

Thus the sheet material assemblage 12 can be easily and safely taken out from the table 11 of the trimmer by means of a very simple mechanism composed of the auxiliary plate 21, the actuating rod 22 and the spring

23. In addition, the position of the alignment block need not be adjusted after trimming operation.

While the presently preferred embodiment of the present invention has been shown and described, it is to be understood this disclosure is for the purpose of illustration and that various changes and modifications may be made without departing from the scope of the invention as set forth in the appended claims.

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## Claims

1. An apparatus for trimming a sheet material assemblage along an edge thereof, said apparatus having a table (11) for placing the sheet material assemblage (12) to be supplied thereon, a knife (13) arranged above and oppositely to said table (11) for trimming the edge of said sheet material assemblage (12), a guide member (17) attached to said table (11), an alignment block (15) connected to said guide member (17) for slide movement on said table (11), and means (16) for selectively fixing the position of said alignment block (15), said sheet material assemblage (12) being abutted against said alignment block (15) at the opposite edge thereof so as to be positioned in a predetermined orientation relative to said knife (13) prior to trimming, characterized by ejection means (21, 22, 23) for registering said sheet material assemblage (12) in said predetermined orientation as it is trimmed by said knife (13) and pushing out said sheet material assemblage (12) in the direction away from said alignment block (15) after trimming.
2. The apparatus for trimming sheet material assemblages in accordance with claim 1, characterized in that said ejection means (21, 22, 23) comprises an auxiliary plate (21) extending parallel to said alignment block (15) and arranged between said alignment block (15) and said sheet material assemblage (12), said sheet material assemblage (12) being abutted against a surface of said auxiliary plate (21) at said opposite edge thereof, at least one actuating rod (22) extending through said alignment block (15) and arranged perpendicularly to said auxiliary plate (21) for movement along its axis, one end of said actuating rod (22) being connected to the opposite surface of said auxiliary plate (21), and a spring (23) attached between said actuating rod (22) and said alignment block (15) in order to resiliently push said opposite surface of said auxiliary plate (21) against said alignment block (15).

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Fig. 1

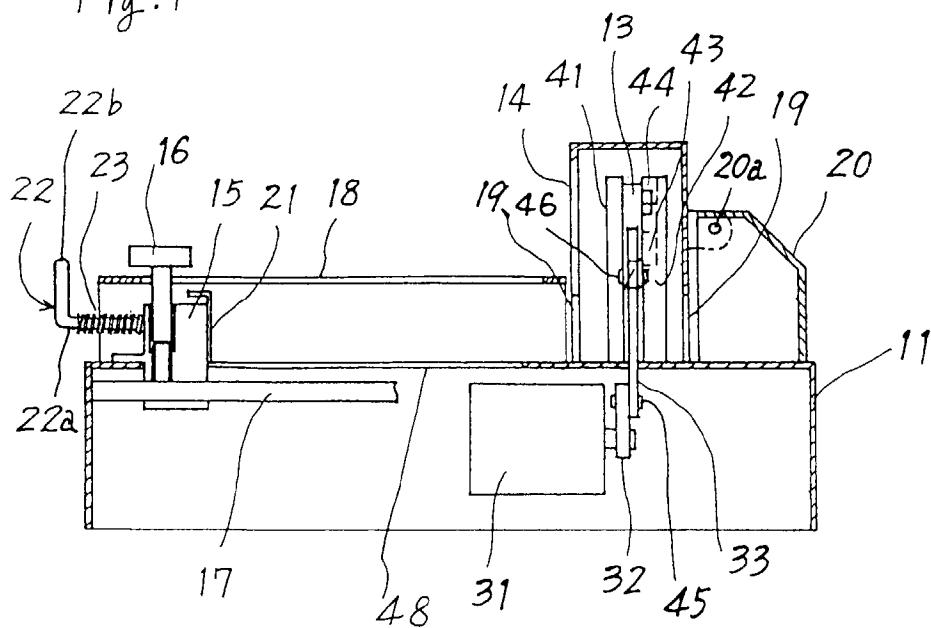


Fig. 2

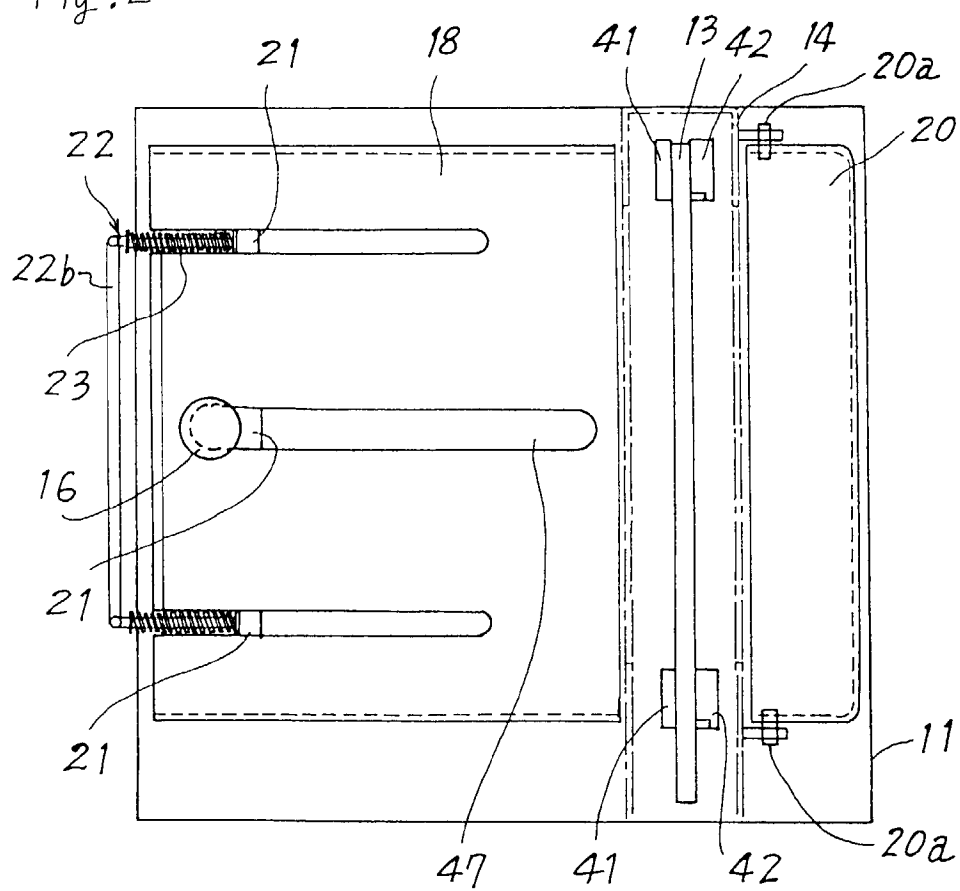


Fig. 3

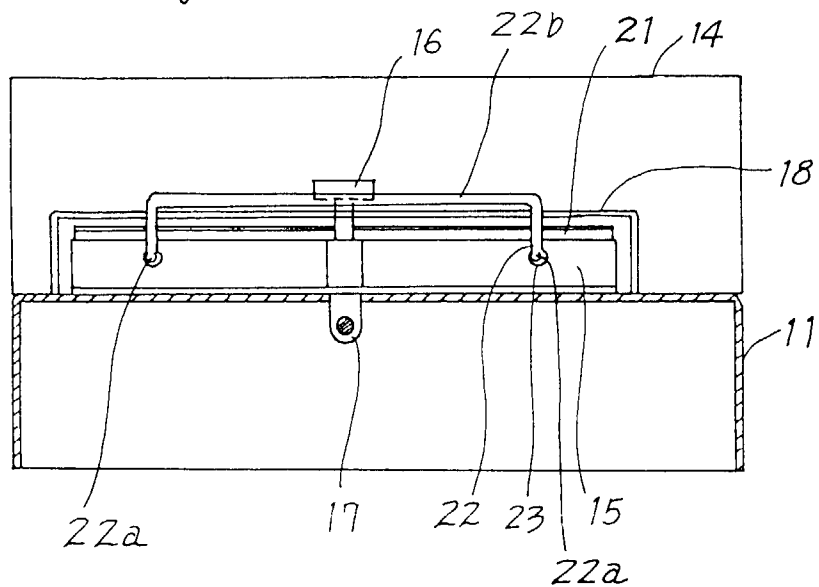


Fig. 4

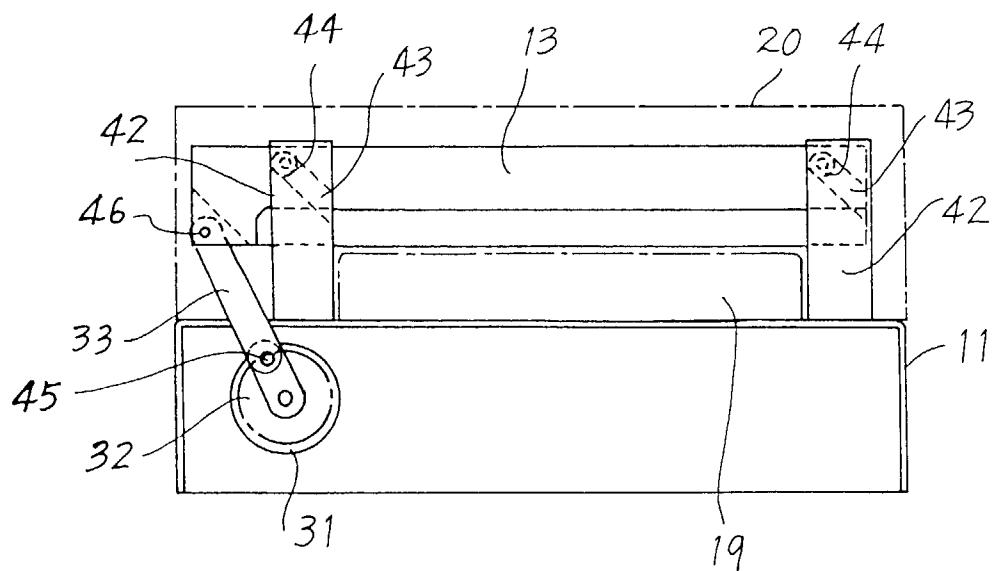


Fig. 5

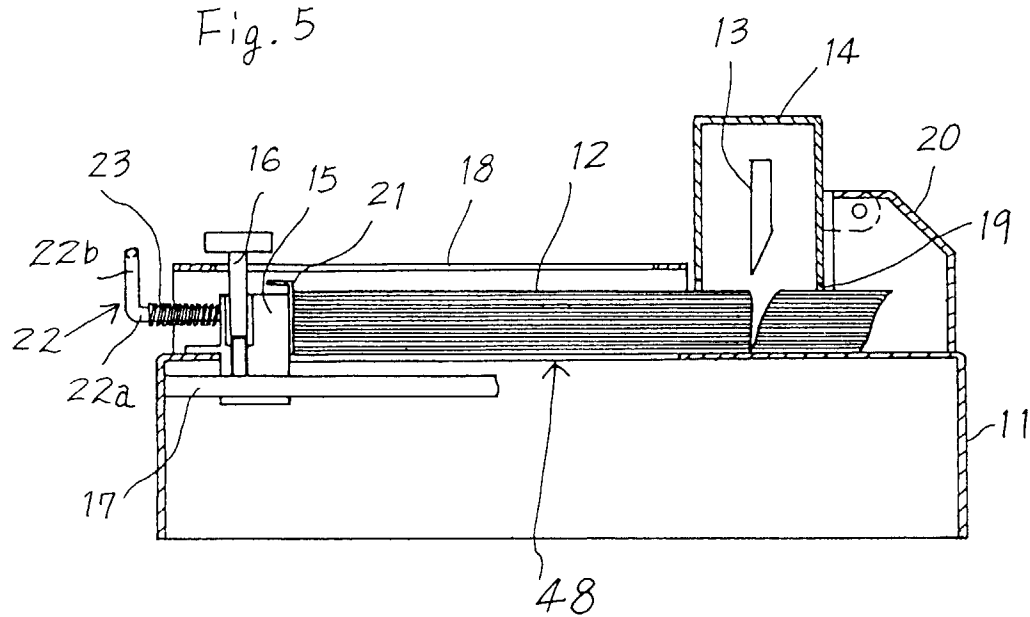


Fig. 6

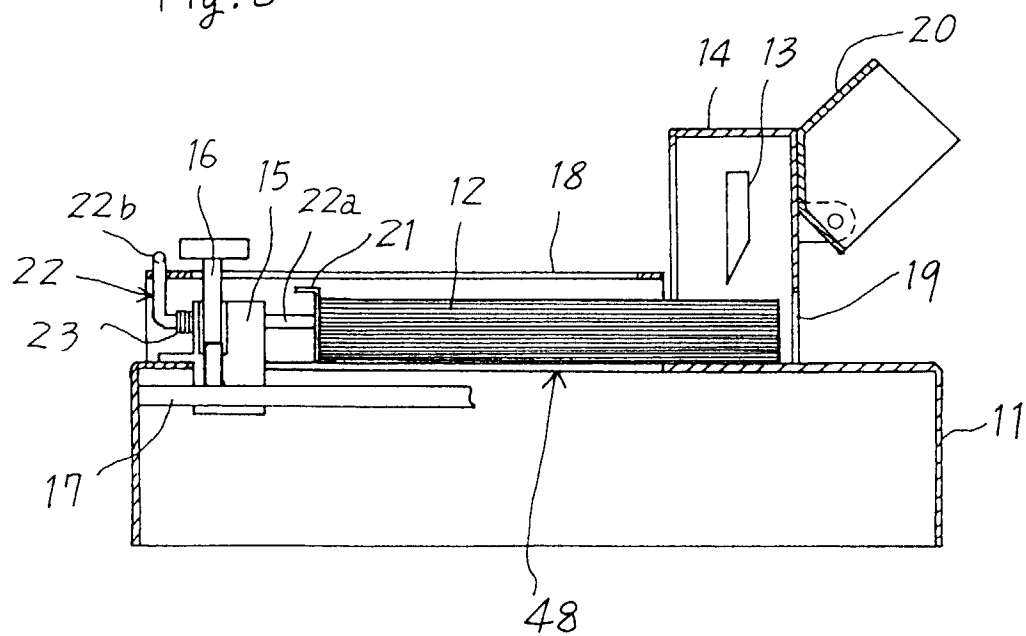




Fig. 7 (Prior Art)

