

May 22, 1956

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2,746,545

DEVICE FOR TRIMMING SHEET MATERIAL

Filed Feb. 19, 1951

2 Sheets-Sheet 1

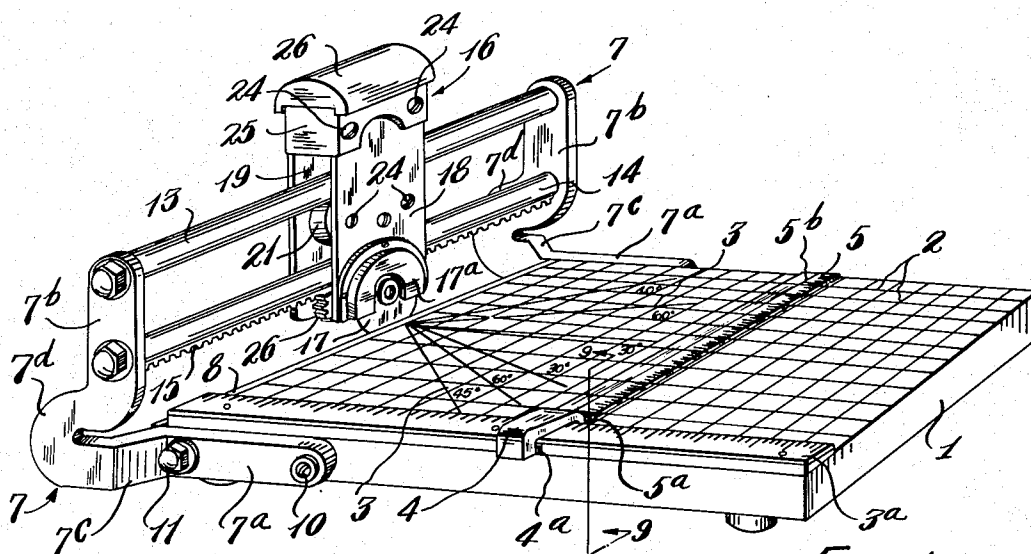


FIG. 1

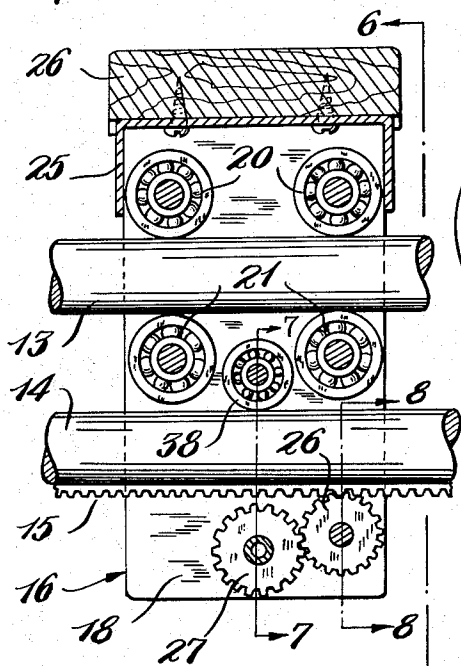


FIG. 2

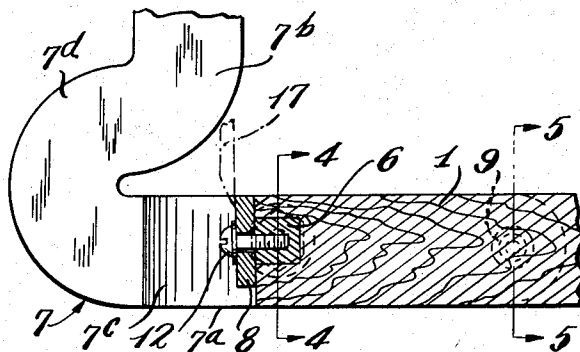


FIG. 3

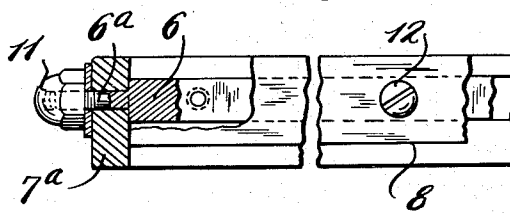


FIG. 4

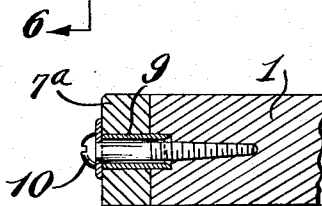


FIG. 5

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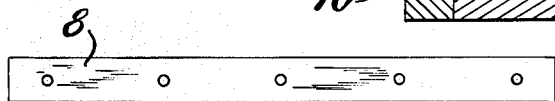


FIG. 1a

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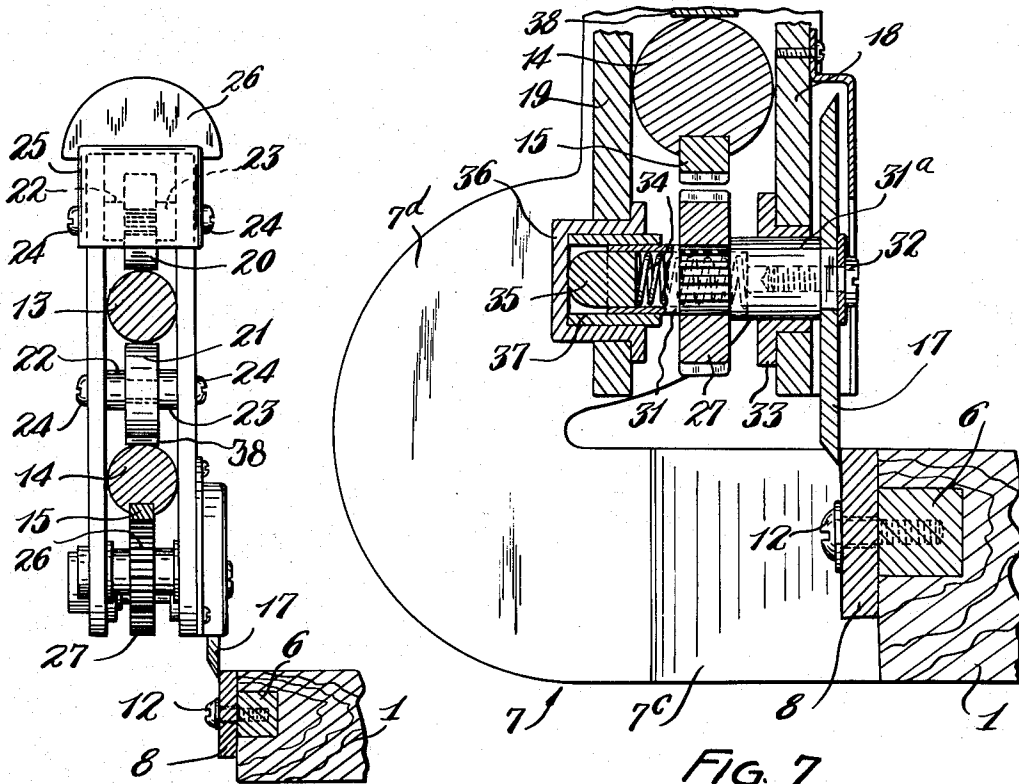


FIG. 6

FIG. 7

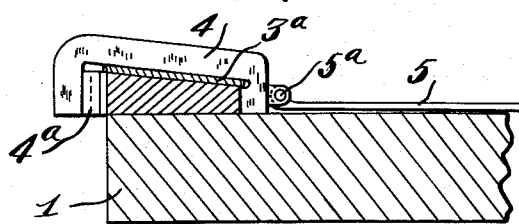


FIG. 9

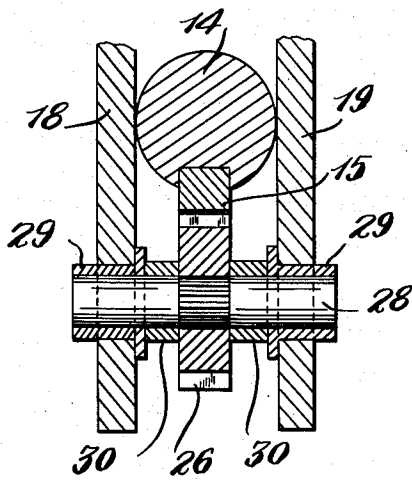


FIG. 8

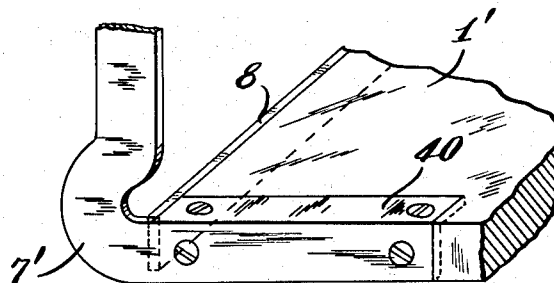


FIG. 10

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1

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DEVICE FOR TRIMMING SHEET MATERIAL

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Application February 19, 1951, Serial No. 211,763

3 Claims. (Cl. 164-77)

This invention relates to an improved form of device for trimming paper or other sheet material and is related to my co-pending application Serial No. 5,237, filed January 30, 1948, now Patent No. 2,626,665.

As in the above-noted co-pending application, so here also the invention relates to a type of device in which the cutting member has straight-line movement along the cutting edge of the board, as distinguished from the more familiar type of device in which a cutting blade is pivotally mounted at one corner of the trimming board and is adapted to be lowered along the cutting edge of the board with a hinge-like movement. As explained in connection with the above-noted application, this old and familiar type of device has proved to be quite objectionable for various reasons.

As also noted in the aforesaid application, the patent to Silver, No. 2,327,223, August 17, 1943, is an instance of later attempts to devise a trimming board in which the trimming element has a straight-line movement; and it is this type of device to which my present improvements relate.

One object of my present invention is to devise a trimming board of this type in which its cutting capacity is extended without increasing the size of the board itself, this feature relating to the particular form and arrangement of my present goose-neck brackets which constitute a still further improvement over those disclosed in my co-pending application, supra.

Another object is to devise a trimming board of this type with an improved means for mounting the rotary cutter assembly upon its carriage which is adapted for straight-line movement.

Another object is to devise a trimming board of this type with an improved means for mounting the reversing gear assembly upon the carriage.

Another object is to devise a trimming board of this type with an improved means for mounting the ball bearing elements upon the carriage for straight-line movement.

Another object is to devise a trimmer of this type with an improved means for mounting the shear blade upon the edge of the trimming board.

Another object is to devise such a trimmer with improved means for mounting the brackets for the carriage rails.

Another object is to devise a trimmer of this type with an improved form of adjustable stop means associated with the scale for repetitive use in trimming.

Another object is to devise such a trimmer with a transparent scale hinged to the adjustable stop, for aligning marks etc. upon the work beneath.

Another object is to devise a trimmer of this type with an improved manner of mounting the carriage upon the rail means for straight-line movement therealong.

Other objects will appear from the following description and claims when considered together with the accompanying drawings.

Fig. 1 is a perspective view of my present invention embodying one form of bracket supporting means;

2

Fig. 1a illustrates the reversible shearing blade;

Fig. 2 is a partial vertical sectional view of the carriage and its operative relation to the rails;

Fig. 3 is a partial detail view illustrating an improved manner of mounting the shearing blade upon the board;

Fig. 4 is a view taken on line 4-4 of Fig. 3 and indicates the manner of mounting the brackets upon an inserted rod in the edge of the board;

Fig. 5 is a view taken on line 5-5 of Fig. 3;

Fig. 6 is a view corresponding to line 6-6 of Fig. 2;

Fig. 7 is a view taken on line 7-7 of Fig. 2;

Fig. 8 is a view taken on line 8-8 of Fig. 2;

Fig. 9 is a view taken on line 9-9 of Fig. 1; and

Fig. 10 illustrates a modification in which the brackets may have integral angular portions for mounting the same upon the board instead of the means indicated in Fig. 1 and other figures of the drawings.

It is to be understood that the present form of disclosure is merely for the purpose of illustration and that there might be devised various modifications thereof without departing from the spirit of my invention as herein set forth and claimed.

Referring now to the accompanying drawings in detail, the board 1 has ruled thereupon the usual vertical and horizontal lines 2 and also the radiating lines 3 for the purpose of facilitating the positioning of the paper or other sheet material thereupon for the trimming operation, either at a right angle or other angles indicated upon the board. The lines 3 radiate at different angles from a point approximately midway of the length of the edge of the shearing blade 8. The scale 3a extends along one edge of the board 1 and there is the adjustable slidably mounted stop 4 which extends about the top and two sides of the scale 3a and has a flat spring 4a for releasably holding the same in position to which it is set for repetitive use when it is desired to trim a succession of sheets to the same extent. As indicated in Fig. 9 of the drawings, the lower edge of this stop and its spring 4a may extend slightly beneath the corresponding edge portions of the scale 3a if so desired. The transparent strip 5 is hinged at 5a to the stop 4 so as to permit the same to be swung upwardly and then lowered upon the work to be trimmed. The strip 5 has longitudinally marked thereupon a hair line 5b for sighting alignment of the same with a mark on a drawing or other work therebeneath, this strip and its mark 5b being parallel with the edge of the shear blade 8. The strip 5 may have a scale marked thereupon and may be detachable from the stop 4 which may be employed either with or without the strip 5.

The rod 6, which may be of square cross section, is inserted within and along the edge portion of the board 1 and is accurately positioned with respect to the top surface of the same; and each end portion of this rod is rounded down and screw-threaded, as indicated at 6a, so as to extend through the bracket arm 7a and to receive the screw-threaded nut 11 for anchoring the bracket arms 7a to the inserted member 6, thereby ensuring fixed and dependable position of the same in spite of the fact that the board 1 may be of wood or other fibrous material. Thus there may be ensured accurate positioning of the shear blade and also proper positioning of the brackets 7 and the rails for the reciprocatory carriage of the cutter to be hereinafter referred to. Holes may be drilled through the blade 8 and in the inserted rod in the same drill jig so as to ensure interchangeability of the shear blades; and, when the rod 6 is in place, the shear blade 8 may be applied thereto by means of the machine screws 12.

Furthermore, each bracket arm 7a is provided near its end with a sized and reamed hole into which is driven the tubular metal anchor 9 with its leading edge beveled

3

and sharpened so as to enter the wood of the board 1. In each instance the metal anchor 9 will receive the wood screw 10 for further securing the end of the bracket arm 7a to the board 1. As will be observed, referring to Fig. 5 of the drawings, the hole through the tubular anchor 9 is over-size as compared with the size of the screw 10; the idea being that if the screw follows the grain of the wood, this will not affect the position of the bracket arm 7a, as would occur except for the present provision.

In actual assembling of this device, the holes in the brackets 7, which receive the ends of the rails 13 and 14 for supporting the same, will be made to occupy position in a true vertical plane with relation to the top surface of the board 1, the nut 11 being only partially tightened during this preliminary procedure. Then, when the proper assembly has been obtained, the nut 11 will be fully tightened and the tubular member 9 will be driven into the board, as above referred to, and the wood screw 10 will then be driven through the anchor member 9 for still further security. Thus there is ensured the correct position of the rails with respect to the top surface of the board and the cutting edge of the shear blade.

The shear blade 8 is made of flat rectangular form and has four sharp ground longitudinal edges, all of which may be employed successively for the shearing operation; and, for this purpose, the holes through the blade 8 may be positioned midway between the two longitudinal edges and may be equi-spaced from the ends of the blade and from each other. Thus this blade is reversible and its position may be changed with a screw driver.

To recapitulate briefly, the rod 6 has fixed position and serves to position the brackets 7 which, in turn, serve to position the rails, and the rails position the reciprocatory carriage for the rotary cutter.

As already indicated, the two parallel rails 13 and 14 have their ends mounted in the upright portions 7b of the brackets; and the lower one of these two rails is provided with a rack 15 along the underside thereof. These rails are adapted to support the carriage 16 for straight-line movement therealong, together with the rotary cutter 17 which is mounted upon the carriage. This carriage 16 comprises the two spaced parallel front and rear walls 18 and 19, respectively, between which there are mounted the pairs of ball bearings 20 and 21 for operative engagement with the upper and lower sides of the upper rail 13. Each ball bearing is pressed onto the middle knurled portion of a spindle which is formed with the integral spacing shoulder 22 and which has a spacing collar 23 pressed onto the same after the ball bearing has been placed upon the spindle; and each spindle is screw-threaded in its two ends for the screws 24 which hold the spindle in each instance between the walls 18 and 19 of the carriage. The screws 24 of the upper pair of ball bearing assemblies serve also as a means for holding the substantially rectangular cover member 25 over the top of the carriage walls 18 and 19; and this cover member may have applied thereto the handle member 26 by which the operator may grip the carriage for moving the same along the rails.

Meshing with the rack 15 there is the reversing gear 26 which meshes also with the gear 27 for driving the same as the carriage is moved along the rails 13 and 14, the idea being to have the cutter rotate in the corresponding direction of the carriage movement during its operation. The reversing gear 26 is pressed tightly onto the knurled middle part of the spindle 28 which is provided with oil-impregnated or self-oiling bearings 29 at its two ends and with the spacing collars 30 between the inner flanges of the bearings 29 and the gear 26 so as to center the same within the carriage 16.

The gear 27 is pressed tightly onto the knurled middle part of the hollow spindle 31 which has its front end screw-threaded to receive the screw 32 which, with its washer, holds the cutter disk 17 in assembly, as clearly indicated in Fig. 7 of the accompanying drawings. The

4

front end portion of the spindle 31 has the flanged oil-impregnated or self-oiling bearing 33 for mounting the same in the wall of the carriage 16. The inside of the spindle 31 is formed with an annular shoulder against which the coil spring 34 may seat; and the rounded-end steel plunger 35 extends within the rear end portion of the hollow spindle 31 and has its inner end engaged by the coil spring 34 while its other end engages against the inner surface of the end of the brass cap member 36 which fits tightly within an opening through the wall 19 of the carriage 16 and which has its inner end flanged for engagement with the inner surface of the wall 19. Between the spindle 31 and the cap member 36 there is provided the oil-impregnated or self-oiling bearing 37 which may be of sufficient extent to serve as a means for centering the gear 27 together with the integrally formed enlarged shoulder portion 31a of the spindle 31. As will be observed from Fig. 7 of the present drawings, the arrangement of the plunger 35 and spring 34 will supply suitable tension to ensure proper engagement of the cutter disk 17 against the shear blade 8 for the trimming operation.

A guard 17a may be provided for the cutter disk 17 and may be mounted upon the wall 18 of the carriage 16.

Depending upon the size of the device, it may be desirable to provide an auxiliary means of support for the carriage 16 so as to relieve the load upon the upper rail 13; and, with this in mind, I have indicated the ball bearing 38 which is mounted at a point midway between the lower ball bearings 21, located directly below the upper ball bearings 20, and which has bearing engagement upon the lower rail 14.

The two brackets 7 have outwardly and rearwardly diverging angular portions 7c and each of these brackets has a rearwardly extending goose-neck portion 7d between the angular portion 7c and the upright portion 7b. The upper edges of the portions 7a and 7c, as well as the corresponding edges of the lower parts of the goose-neck portions are flush with the top surface of the board 1 so that it is possible to move a strip of sheet material lengthwise of the shearing blade and to cut from the strip a maximum width corresponding to the depth of the goose-neck; and furthermore there is obtained a virtual extension of the board lengthwise of the shear blade. In this way I am able to increase the utility of the trimmer and also its cutting capacity without increasing the size of the board 1 itself.

Now I will describe a modified means for mounting the brackets upon the board, attention being called to Fig. 10 of the present drawings. In this modification each bracket is provided with an integrally formed angular portion 40 which engages the corner portion of the board 1' and is countersunk so as to be flush with the top surface of the board, as well as the edge portion thereof. Thus the angular portion will not interfere with the location of the scale 3a and will serve as a means of accurately positioning the bracket, in each instance, for the rails. In case the board be made of wood or other fibrous material, the insert rod 6 may be provided for mounting the shear blade, as above described. However, the member 9 may be omitted, as also the threaded end 6a of the rod, if so desired, in each instance. The angular portions 40 may be screwed to the board 1' and the fixed predetermined position of these angular portions will ensure accurate vertical positioning of the brackets and hence accurate vertical alignment of the rails 13 and 14. These brackets and their angular portions, in each instance, may be formed as a one-piece metal stamping.

Instead of making the board of wood or other fibrous material, it may be made of metal; in which event the insert rod 6 may be omitted and the shear blade may be applied directly and accurately to the edge of the board by means of machine screws. In this case the edge of the board would be machined and the holes for the shear blade would be drilled and tapped accurately for ma-

5

chine screws. Also, in the case of a metal board, the tubular anchor members 9 will be omitted and the angular portions 40 will have accurate countersunk engagement upon the board, as above described, so as to properly position the brackets for the rails 13 and 14.

There are numerous advantages which result from my present invention. For instance, in adopting my means for mounting the shear blade upon a wooden board, there may be eliminated the inaccuracy and difficulty which would otherwise be experienced because of the natural tendency of the screws to follow the grain of the wood, this improvement including also the fixed predetermined mounting of the brackets. I have devised a means for accurately mounting the brackets in the case of a metal board also. In both instances, this means accurate positioning of the rails upon which is mounted the cutter carriage. This assembly is further improved in both efficiency and economy by the provision of a shearing blade with four shearing edges which may be employed in succession by readily changing the position of the blade. The adjustable stop and its means for holding the same in adjusted position constitutes another improvement, as do also the transparent scale associated therewith, and the ruling of the board with radiating lines as well as horizontal and vertical lines for positioning the sheet material for shearing at different angles. Other improvements in my present device reside in the particular means for mounting the ball bearings and the two gears within the cutter carriage, and also the means for distributing the load of the carriage upon the rails. Furthermore, by means of the goose-neck form and arrangement of the brackets at the two ends of the shear blade, it is possible not only to trim a certain width from a strip of sheet material up to the depth of the goose-necks by advancing the same along the shear blade between successive shearing operations, but also the capacity of the trimming board is virtually increased in a direction lengthwise of the shear blade without having to increase the size of the board itself. In this invention it will be noted that the upper surface of the lower part of each goose-neck is flush with the upper surface of the board itself, and the diverging form and arrangement of the goose-neck brackets permit the carriage with the cutter to be moved along the shear blade farther in both directions. Thus I have devised a trimmer which is capable of operating in a most accurate, efficient, dependable and convenient manner and which possesses improvements not heretofore found in other devices of this same general type, so far as I am aware.

What I claim is:

1. A trimmer comprising a board of fibrous material, a metal rod inserted within the edge of said board, brackets at the two ends of said inserted rod, said brackets having means for anchoring the same to said board and for securing the same to said inserted rod, a shear blade of metal fixedly mounted upon said inserted rod, rail means mounted upon said brackets and extending parallel to the edge of said shear blade, a carriage

6

slidably mounted upon said rail means, a rotatable cutter mounted upon said carriage and being adapted for operative engagement with the cutting edge of said shear blade.

2. A trimmer comprising a board of fibrous material, a metal rod inserted within the edge of said board and having screw-threaded end portions, brackets at the two ends of said inserted rod, said brackets having means for anchoring the same to said board and for securing the same to said screw-threaded ends of said inserted rod, a shear blade of metal fixedly mounted upon said inserted rod, rail means mounted upon said brackets and extending parallel to the edge of said shear blade, a carriage slidably mounted upon said rail means, a rotatable cutter mounted upon said carriage and being adapted for operative engagement with the cutting edge of said shear blade.

3. A trimmer comprising a board of fibrous material, a metal rod inserted within the edge of said board and having screw-threaded end portions, brackets at the two ends of said inserted rod, each of said brackets having a rearwardly extending portion, the opposite edges of said board each having a hole therein, the rear end portion of each bracket having a tubular metal anchor member attached thereto and a screw extending through said anchor member for securing the same in position within said hole in said board, the opening through said metal anchor member being over-size as compared with the size of the screw therethrough, each of said brackets having also means for securing engagement between the same and said screw-threaded ends of said inserted rod, a shear blade of metal fixedly mounted upon said inserted rod, rail means mounted upon said brackets and extending parallel to the edge of said shear blade, a carriage slidably mounted upon said rail means, a rotatable cutter mounted upon said carriage and being adapted for operative engagement with the cutting edge of said shear blade.

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