C. LUTZE.

CUTTER HEAD.

APPLICATION FILED MAY 25, 1915.

1,162,792.

Patented Dec. 7, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

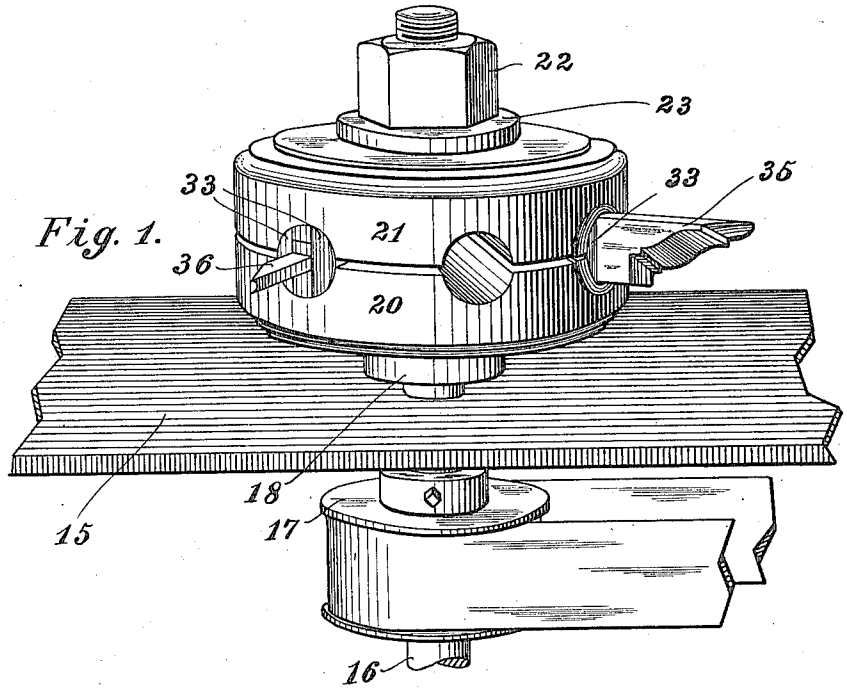
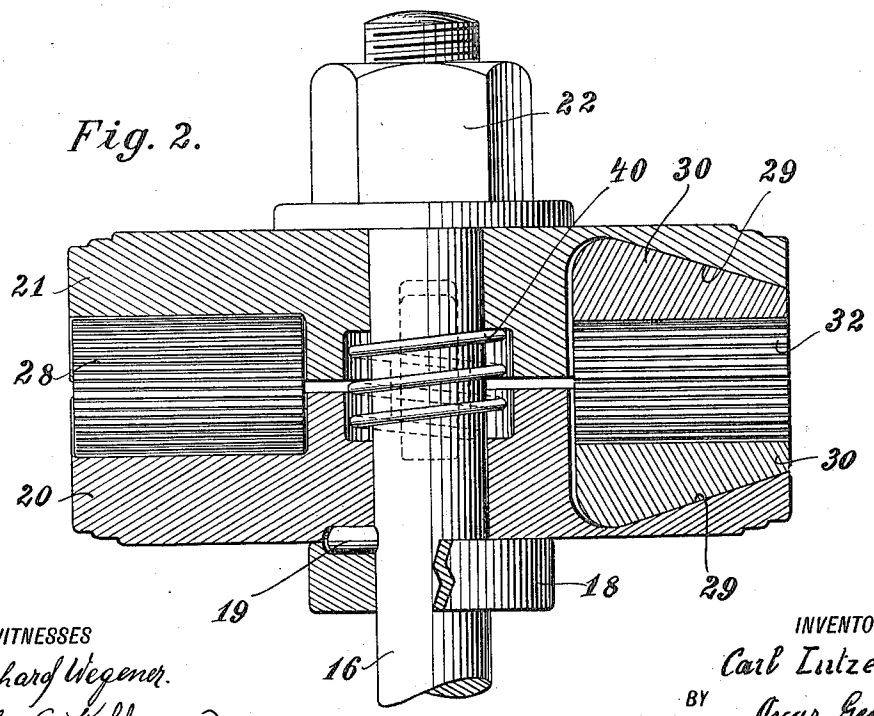


Fig. 2.



WITNESSES

Richard Wegener.

Lulu A. Stohlmann.

INVENTOR

Carl Lutze

BY HIS Oscar Geier ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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Fig. 3.

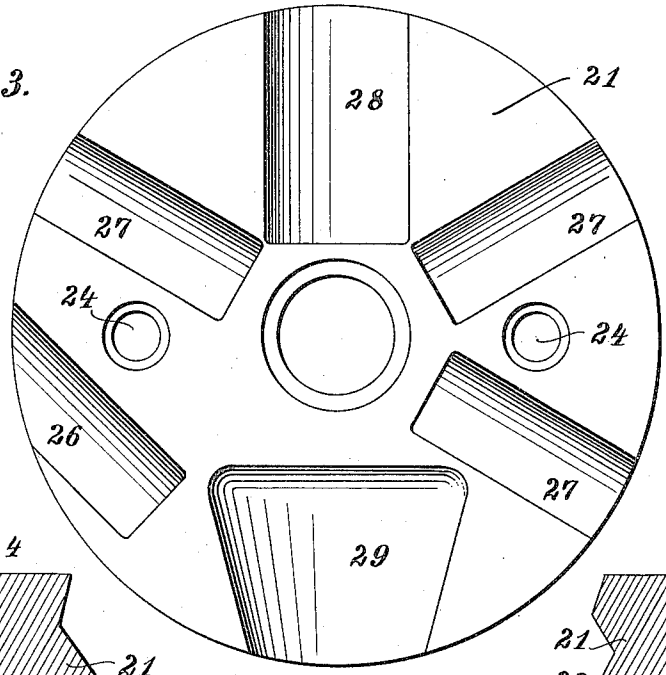
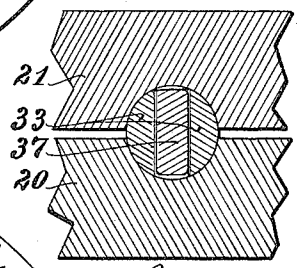


Fig. 6.



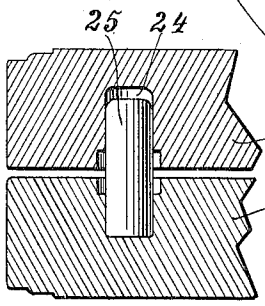


Fig. 5.

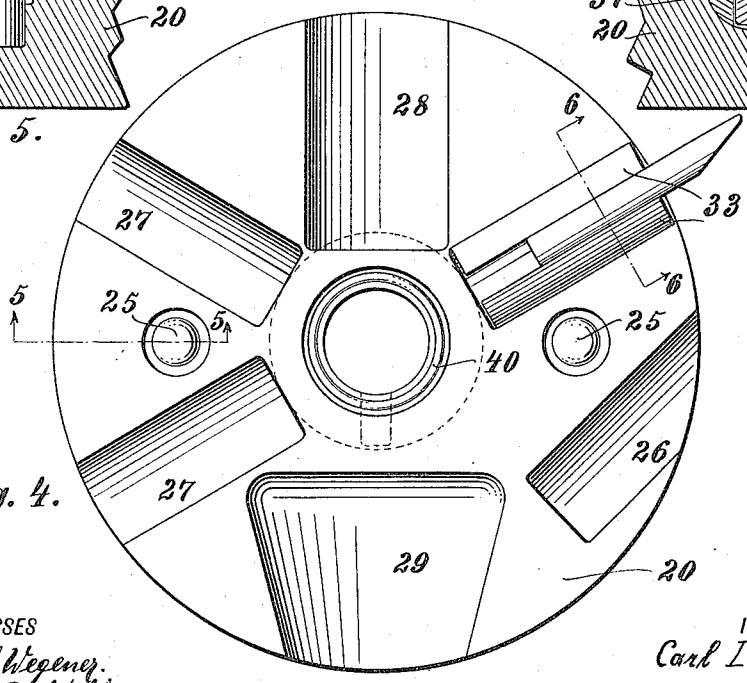


Fig. 4.

WITNESSES

Richard Wegener.

Luke A. Kohlmann

INVENTOR

Carl Lutze

BY HIS ATTORNEY

Oscar Geier

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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3 SHEETS—SHEET 3.

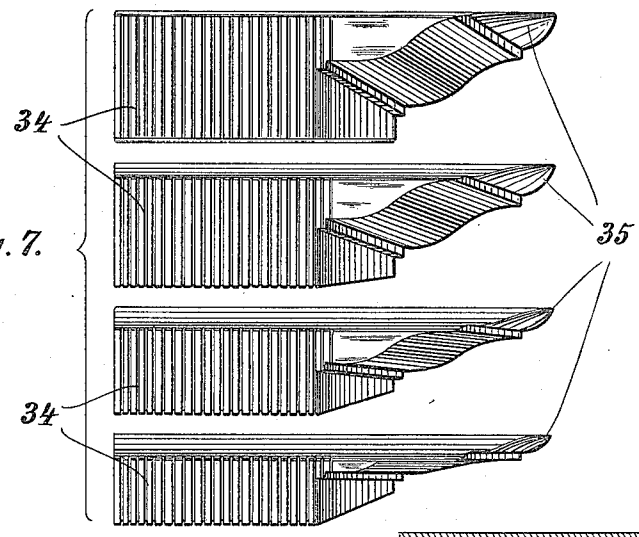
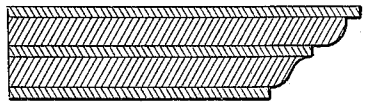


Fig. 7.

Fig. 10.



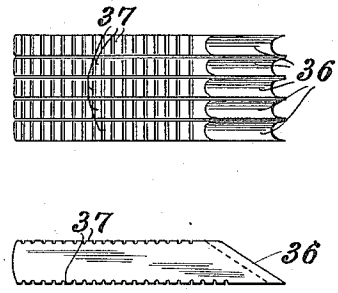


Fig. 8.

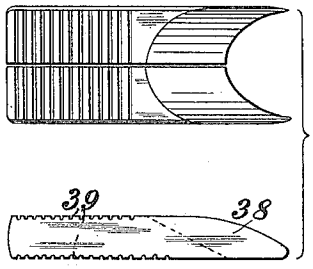


Fig. 9.

Fig. 11.

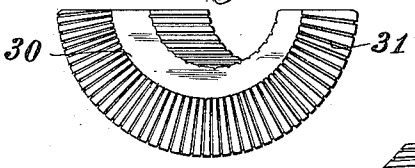
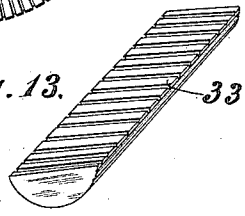


Fig. 13.



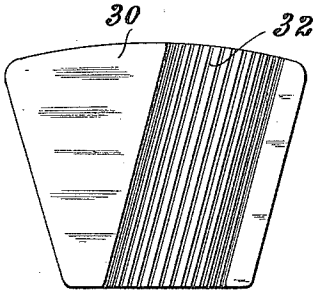


Fig. 12.

WITNESSES

Richard Wegener.

Lulu A. Kohlmann

INVENTOR

Carl Lutze

BY Oscar Geier

HIS ATTORNEY

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CARL LUTZE, OF NEW YORK, N. Y.

CUTTER-HEAD.

1,162,792. Specification of Letters Patent. Patented Dec. 7, 1915.

Application filed May 25, 1915. Serial No. 30,290.

To all whom it may concern:

Be it known that I, CARL LUTZE, a subject of the Emperor of Germany, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Cutter-Heads, of which the following is a specification.

This invention relates to improvements in power driven, wood working mechanisms, in which one or more knives are rotated at a high speed by means of a vertical spindle, adjustable with reference to a work table, the knife being held in what is commonly termed a cutter head.

The object of the invention is to provide a cutter head of the class mentioned, having means for securing the knives or cutters rigidly in preferred adjustment, angularly with respect to their cutting edge and the radial distance from the axial center of rotation.

Another object is to provide means whereby a combination of knives can be used in the same holder, each independently adjustable with respect to radial extension, and all so held as to preclude the possibility of movement in the cutter head, as by contact with the work or centrifugal force, and finally to provide a cutter head which may be cheaply constructed, accurately balanced and easily operated.

These objects are attained by the novel construction and arrangements of parts hereinafter described and shown in the accompanying drawings, forming part of this specification, and in which:—

Figure 1 is a perspective view of a cutter head, made in accordance with the invention and illustrating its application. Fig. 2 is a vertical sectional view of the head showing the interior arrangement. Fig. 3 is a bottom plan view of the upper clamp element. Fig. 4 is a top plan view of the lower clamp element, a knife and holder being shown in position. Fig. 5 is a fragmental transverse sectional view, taken on line 5—5 of Fig. 4. Fig. 6 is a fractional sectional view, taken on line 6—6 of Fig. 4. Fig. 7 is a collective view showing a single form of knife and indicating the different angles at which it can be operatively held. Fig. 8 shows respectively plan and side views of another form of knife arranged in series. Fig. 9 presents similar views of a different form of knife, arranged in pairs. Fig. 10 is a sectional elevational view of a composite knife. Fig. 11 is an end view of one section of a form of knife holder sleeve. Fig. 12 is a side view of the same, and, Fig. 13 is a perspective view of a knife holding block.

In machines of the kind described it is usual to have a work supporting surface or table 15, of solid nature, through which extends a vertical spindle 16, driven by a pulley 17 below the surface, the work thereon ordinarily in the form of wood strip being guided in its passage past the cutter head by suitable devices engaging with slots formed longitudinally in the table, or by guides adjustable on its surface, the spindle being vertically adjustable with reference to the table surface. A collar 18 is rigidly secured to the spindle 16, and partially embedded in it is a pin key 19, driving the lower knife holding element 20 of the cutter head which rests upon the upper surface of the collar 18. The upper or clamp element 21 of the cutter head may be firmly pressed against the lower by means of the clamp nut 22 and washer 23. In each of these elements, on opposite sides, are drilled holes 24 receptive of studs 25, permanently secured in the lower element, acting to secure exact registration of the elements and also as drivers therebetween. Both these holes may be countersunk slightly to provide space for dust, etc., that might otherwise prevent intimate contact between the parts.

Formed equally in each of the adjacent faces of the cutter head elements are a plurality of semi-cylindrical, cross sectioned cavities, of different areas for securing the knife shanks and their holders. One pair of these cavities 26, is formed tangentially, for use if it be desired to insert knives in that manner; other openings 27 and a single opening 28 are radial and differ only in size, their counterparts being formed on opposite sides of the head in order to assist in maintaining a balance. On the side opposite to the larger cavity is an opening 29, the longitudinal section of which is in the form of a truncated cone having a radial axis with the base toward the interior. Suited to this shape is a frusto-conical sleeve 30 comprised of a pair of elements having roughened or corrugated conical surfaces 31 to engage with the opening without slipping or displacement and having formed between them a circular opening 32, eccentric with the exterior and also having its axis at an angle divergent from that of the cone. The in-

terior of this opening is corrugated longitudinally and adapted to receive a knife shank and its holders 33, which, like the others, are parallel blocks having curved exteriors and flat faces engageable on each side of the knife shanks 34, both the shanks and faces being corrugated transversely in order to engage and hold with the requisite rigidity when under pressure through the clamp nut 22. Thus it will be seen that the knives 35 can readily be adjusted as to the distance they are to project out beyond the cutter head and also as to the cutting angle with reference to the shank, which obviously can be clamped in any position whatever, the wedge effect of the holders securing the knives with utmost rigidity.

From Fig. 7 it will be evident that by turning the knives 35 upon the longitudinal axis of their shanks 34 a wide range of shapes may be produced by a single knife, a feature not possible with heads of ordinary construction.

In Figs. 8 and 9 it may be seen that the cutter is made up of a plurality of knives 36 and 38, held in the same holder, by their shanks 37 and 39 and obviously blanks or other forms of knives may be interposed between them or so combined as to produce required results, as shown in Fig. 10. It is also possible to use a counterbalancing blank in the opening opposite the knife or introduce another knife whereby other results may be attained. Furthermore the peculiar conical sleeve 30 permits the knife to be adjusted vertically, horizontally and angularly, in fact in every possible direction and also provide an efficient clamping means for it. In adjusting or changing the knives, the nut 22 is loosened in order to manipulate the holders, the upper element being raised as it is released by means of the spring 40, the holders turned on their axis, as may be desired, the knife put in place and the nut again applied.

The operation will be readily understood from the foregoing by those familiar with the art and it will be obvious that a wide range of molding shapes can be produced with a limited number of cutting knives.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a cutter head, a pair of clamp elements having recessed cavities of circular cross section in their adjacent faces, segmental blocks suited to the mentioned cavities, said blocks being arranged in pairs and corrugated longitudinally upon the exteriors and transversely upon their adjacent faces, knives having corrugated shanks engaged with the faces of said blocks, and means for securing said knives between said clamp elements.

2. In a cutter head, a pair of cylindrical elements having a plurality of semi-circular depressions formed equally in each, the depressions being of varying area and differently disposed, means for clamping said elements, segmental blocks disposed in pairs in the mentioned depressions and spaced apart therein, one or more knives engageable between said blocks in the mentioned depression, and means combined with said blocks and said knives whereby the latter are positively held in an adjusted position.

3. In a cutter head having a pair of separable cylindrical clamp elements and formed with one or more frusto-conical depressions equally in each, a conic sectional sleeve engaged in the depressions, said sleeve having a cylindrical passage eccentrically formed therethrough, a knife, means for positively engaging said knife in the mentioned passage, and means for clamping said knife in an adjusted position.

4. In a cutter head having a pair of separable cylindrical clamp elements and formed with one or more frusto-conical depressions equally in each, a conic sectional sleeve engaged in the depressions, said sleeve having a cylindrical passage formed therethrough in a different axial plane to that of the sleeve, one or more knives having shanks suited to the mentioned passage and means for clamping said knives in an adjusted position therein.

5. In a cutter head having a sectional clamp element and formed with one or more frusto-conical depressions equally in each section, a conic sectional sleeve rotatably engaged in the depressions, knives positively engaged in said sleeve, and means combined with said sleeve whereby said knives may be adjusted relative to its axis.

Signed at New York, in the county of New York and State of New York, this 15th day of May, A. D. 1915.

CARL LUTZE.

Witnesses:
IRA H. GARLICK,
ERICH GOESTL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."