Sept. 23, 1969 G. A. LA CAS 3,468,195

METHOD OF MAKING NARROW RIBBON BLADES

Filed Dec. 27, 1965

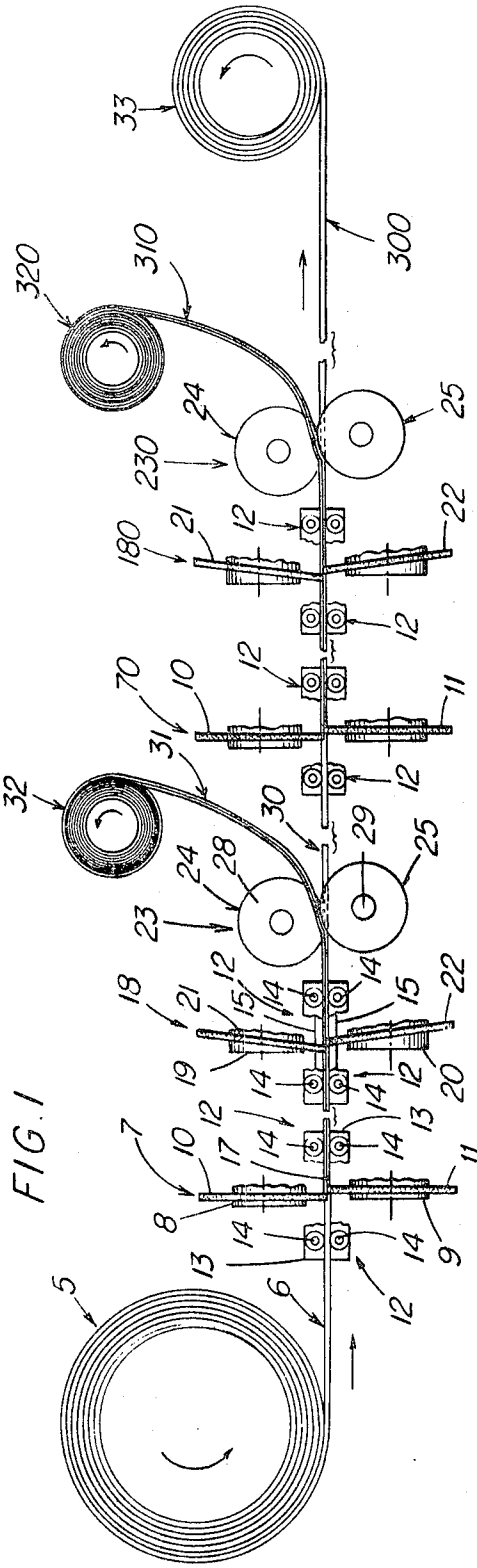


FIG. 1

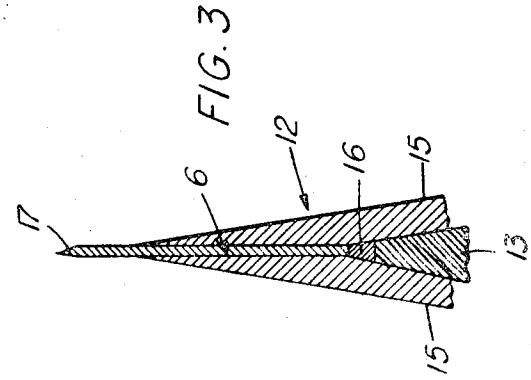


FIG. 3

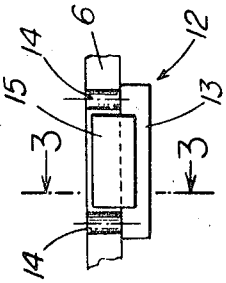


FIG. 2

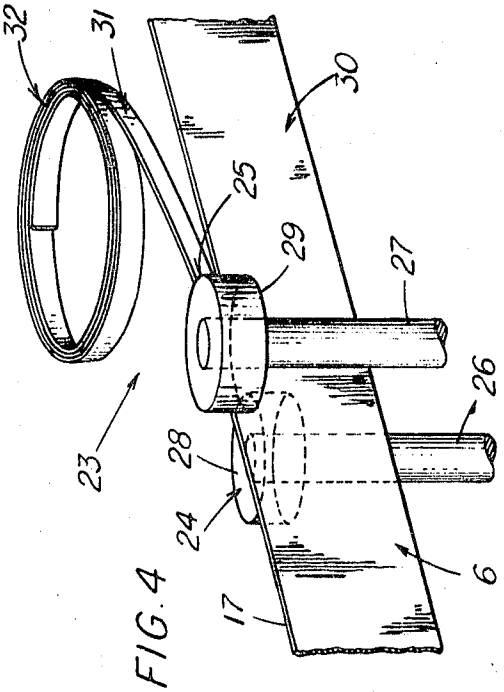


FIG. 4

United States Patent Office 3,468,195
Patented Sept. 23, 1969

3,468,195

METHOD OF MAKING NARROW RIBBON BLADES

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Filed Dec. 27, 1965, Ser. No. 516,496
Int. Cl. B21k 11/00
U.S. Cl. 76—104 1 Claim

ABSTRACT OF THE DISCLOSURE

This invention pertains to a method of making narrow ribbon blades of coilable type having a single cutting edge and which is of a width and such high flexibility as to make it very difficult for an unsharpened blank therefor to be guided securely and accurately through edge shaping and sharpening means. This method includes successively the following steps. A continuous supply strip of metallic blade material is provided in a width appreciably wider than the intended coilable narrow ribbon blade to be obtained therefrom, and preferably in a width at least a multiple of such desired ribbon blade width. This width of the supply strip is sufficient to assure secure and accurate guidance progressively through edge shaping and sharpening means for sharpening one longitudinal edge thereof. This continuous supply strip is continuously passed longitudinally through such shaping and sharpening means with progressive sharpening of one longitudinal edge thereof. The resulting sharpened supply strip is continuously and progressively severed longitudinally along the line generally parallel to and spaced a short distance from the sharpened edge as the progressive longitudinal passing of this supply strip is continued, so as to sever therefrom the desired sharpened ribbon blade. Preferably the remainder base strip after severing such sharpened ribbon blade from the supply strip is continuously passed longitudinally through additional edge shaping and sharpening means progressive to sharpen a longitudinal edge of this remainder base strip; and thereafter this base strip is continuously severed longitudinally along a line generally parallel to and spaced a short distance from the sharpened edge of this remainder base strip during the continuance of the progressive longitudinal passing thereof so as to sever another desired sharpened ribbon blade from the remainder base strip. Other features of the invention appear in the following specification and accompanying drawing.

The present invention relates to a method of making narrow ribbon blades, each of which is an elongated strip of indefinite length and formed from relatively thin metallic blade stock that may be coiled lengthwise. Such a coilable narrow ribbon blade is particularly useful for loading into a reel type shaving instrument or razor. For this purpose the ribbon blade may be coiled about a supply reel mountable on the razor to be progressively fed across a shaving section of the latter to a take-up reel thereon, and such reels may be mounted within a replaceable magazine as is well-known in the shaving instrument art.

The sharpening of a longitudinal edge of such an elongated, coilable, narrow ribbon blade presents a problem of securely holding or supporting it while one longitudinal edge thereof is being shaped and sharpened, such as by grinding, honing and stropping with conventional equipment through which it is progressively fed. Such a narrow strip is difficult to properly support securely opposite the points of contact between the abrasive wheels and the longitudinal edge being sharpened in such a conventional sharpening machine.

It is an object of the present invention to solve this problem in a simple and efficient manner by providing the blade material in the form of a relatively wide continuous stock or supply strip which is of a width appreciably wider than the intended coilable narrow ribbon blade desired. The width of this continuous stock or supply strip is sufficient to assure secure guidance with proper support through such conventional edge shaping and sharpening means or other suitable means for effectively sharpening one longitudinal edge thereof, and it may be in width a multiple of the width of the narrow ribbon blade desired. After one longitudinal edge of the continuous stock or supply strip of metallic blade material has been sharpened by progressively feeding it through suitable edge shaping and sharpening means it is continuously severed longitudinally along a line generally parallel to and spaced a short distance from the sharpened edge to sever from this continuous supply strip the desired sharpened ribbon blade.

In the practice of the method of the present invention the desired sharpened ribbon blade and the remainder base strip may be coiled up separately on appropriate reels. The sharpened ribbon blade may then be drawn off from its storage reel and cut into appropriate lengths with each length then being reeled and placed into the blade magazine of such a reel type shaving instrument. The wider remainder base strip may be reeled off from its storage reel progressively to be passed through such edge shaping and sharpening equipment which has its strip guide means properly adjusted to the reduced width of the remainder base strip for sharpening in similar manner a longitudinal edge thereof. Then again this sharpened remainder base strip is severed longitudinally along a line generally parallel to and spaced a short distance from its sharpened edge to sever therefrom another desired sharpened ribbon blade. This procedure may be repeated so long as the width of the remainder base strip is sufficient to be effectively supported by the strip guide means of the machine.

In accordance with the present invention such repeated production of narrow ribbons of the desired coilable blades may be successively formed by following a group of grinding and honing means or other suitable edge shaping and sharpening means with the longitudinal severing means employed in the practice of the present method and duplicating such equipment thereafter successively to provide a plurality of succeeding sections from the terminal end of each of which is drawn off one of the desired sharpened ribbon blades.

Abrading means to sharpen a longitudinal edge of the continuous stock or supply strip, or of the base strip remaining after the desired sharpened narrow ribbon blade has been severed longitudinally therefrom, may be a machine of conventional construction. Thus, it may include a supply reel about which is coiled a thin continuous stock or supply strip of metallic blade material to be fed progressively through a succession of operating stations of the machine which may comprise a grinding station, a rough honing station, a finish honing station, a cleaning station and a stopping station. By way of example, the patent to Delafontaine No. 2,709,874 illustrates one such conventional arrangement of commonly employed grinding, honing and stropping wheels, and the patent to Hill No. 2,290,964 illustrates other equipment to shape and sharpen a longitudnial edge of a blade stock or supply strip by abrading action, which may be employed in the practice of the present invention. Such machines are equipped with suitable strip guide means which securely support the progressively fed strip as it is passed through the abrading or grinding, honing and stropping stations and as a longitudinal edge thereof is sharepend thereby to the desired keenness. For this pur-

sharpened thereby to the desired keenness. For this purwhich bear against the opposite sides of the traveling strip in the vicinity of the abrasive wheels and guiding channel structure through which the strip snugly and smoothly slides while exposing one of its longitudinal edges to the action of the abrading or grinding, honing and stropping equipment. Such guiding rolls and channel structure may require an appreciable lapping of the sides of the stock strip for effective support thereof at the abrasive wheels during the shaping and sharpening action. The copending application of James B. Kruger for Method and Apparatus for Shaping, Sharpening and Polishing Razor Blades, Ser. No. 419,836, filed Dec. 21, 1964, teaches the construction and use of electro-chemical equipment to shape and sharpen a longitudinal edge of such a stock strip, which may also be used in practicing the present invention.

It is another object of the present invention to adapt any such edge shaping and sharpening means to the production of the narrow ribbon blades of coilable type effected by practice of the present method by augmenting it with suitable longitudinal severing equipment to separate from such a sharpened supply or base strip a relatively narrow zone along the sharpened edge to obtain each narrow, sharpened, ribbon blade strip.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the several steps and the relation of one or more of such steps with respect to each of the others thereof, which will be exemplified in the method hereinafter disclosed, and for a fuller understanding of the nature and objects of the invention reference should be had to the following detained description taken in connection with the accompanying drawing, in which:

FIG. 1 is a diagrammatic layout of a machine equipped efficiently to practice the method of the present invention, grinding and honing means thereof being of conventional construction and parts unnecessary to an understanding of the use thereof being broken away;

FIG. 2 is a side elevational view to enlarged scale of strip guide means of the equipment illustrated in FIG. 1;

FIG. 3 is a sectional view to still larger scale taken substantially on line 3—3 of FIG. 2; and

FIG. 4 is a perspective view, with parts broken away, of the longitudinal severing equipment illustrated in FIG. 1.

In the drawings, like numerals identify similar parts throughout.

It will be understood from FIG. 1 that the conventional sharpening equipment may include suitable reel means to support a coil 5 of a continuous supply strip 6 of thin metallic blade material for progressive feed therefrom through conventional sharpening equipment. The conventional sharpening equipment may include at a grinding station 7 a pair of opposed driven rolls 8 and 9, each of which supports a gang of axially-spaced coarse abrasive wheels 10 and 11 (only one of each gang being shown by way of example). As is indicated in FIG. 1 the abrasive wheels 10 preferably are staggered with respect to the abrasive wheels 11. It is common knowledge in this art such grinding wheels progressively chamfer off opposite side corners of the opposed edge of the continuous supply strip 6 as it is progressively fed through the bight between such abrasive wheels being effectively and securely supported by suitable guide means 12.

Such effective strip-supporting guide means 12 may, as is more clearly illustrated in FIGS. 2 and 3, comprise a suitable fixed base member 13 on opposite ends of which are rotatably mounted pairs of transversely-spaced guide rolls 14 between which the continuous supply strip 6 is drawn. Base member 13 also carries a pair of opposed and laterally-spaced side plates 15, which may be mounted to the former by any suitable means, such as screws (not shown). Between side plates 15 is interposed a longitudinally-extending backing strip 16 of suitable wear resistant steel which may be case hardened, or of carbide material. These side plates 15 and this backing strip 16 together define a guide channel through which the continuous supply strip 6 snugly and smoothly slides, with its longitudinal edge 17 which is being sharpened by the action of the grinding wheels 10 and 11 exposed for such action, as will be best understood from FIG. 3.

At a succeeding station 18 the ground edge 17 of the continuous supply strip 6 is roughly honed by conventional honing equipment. Such honing equipment may also comprise a pair of rotatably driven rolls 19 and 20 which may carry abrasive wheel means in the form of a helical abrading land, one turn of each of which is depicted at 21 and 22. Such rough honing station 18 may be followed by a finish honing station which is similar to that located at 18, but with the abrading material being finer.

The fine honing station may be followed by suitable cleaning equipment after which the sharpened longitudinal edge of the continuous supply strip 6 may be subjected to the action of stropping wheels. Such stropping wheel structure may be similar to the grinding equipment at station 7, except that the wheels are formed of stropping leather to produce the desired keenness of the sharpened edge.

Following such sharpening of the exposed longitudinal edge 17 of the continuous supply strip 6 the latter is passed through a longitudinal severing station 23. There may be provided at the severing station 23 suitable strip guiding means (not shown) which may be similar to that depicted in FIGS. 2 and 3, on opposite sides of which and the blade strip 6 are mounted a pair of rotatably driven severing rolls 24 and 25, each respectively mounted upon one of a pair of driven shafts 26 and 27 (see FIG. 4). The severing rolls 24 and 25 may be made from suitably case hardened steel or carbide material and it will be seen from FIGS. 1 and 4 that severing roll 24 has a flat top end 28 located in a transverse plane with the transverse bottom end 29 of severing roll 25 located in a parallel transverse plane spaced only slightly from the former so that arcuate marginal sections of these surfaces may be lapped in the manner illustrated in FIG. 1. Consequently, as the sharpened continuous supply strip 6 is fed into the approach bight of the driven severing rolls 24 and 25 the narrow longitudinal zone adjacent the sharpened edge 17 of the supply strip is progressively severed or sheared away from the remaining base strip 30 to define the desired sharpened narrow ribbon blade 31. This continuously formed sharpened narrow blade 31 will be coiled up on a suitable take-up reel to provide coil 32. The coil 32, after production, may then be fed through other suitable equipment familiar to those skilled in the art for severing lengths therefrom, each of which is to be loaded into a magazine for a reel type shaving instrument.

As will be understood from FIG. 1, while the remainder base strip 30 may also be coiled up on a suitable tape-up reel for subsequent use as a continuous supply strip to be worked in the above described manner it may be fed directly through another section of the same machine which may include grinding, honing and stropping equipment similar to that described above as preceding the severing equipment at station 23, so as to include another grinding station 70 and another honing station 180 followed by another severing station 230, another take-up reel on which will be coiled a second roll 320 of sharpened narrow ribbon blade, and another take-up reel about which will be laid down a coil 33 of the second remainder base strip 300.

It is to be understood that instead of reeling up the remainder base strip 300 following the severance therefrom of the second sharpened narrow ribbon blade 310 to be later passed through suitable grinding, honing and stropping equipment of conventional construction it may be fed directly progressively through a third section of

the machine in the manner illustrated in the second section depicted in FIG. 1 for production therefrom of a third continuous sharpened narrow ribbon blade. Additional successive sections may be provided in the same equipment for successively sharpening a longitudinal edge of each remainder base strip after it leaves a longitudinal severing station like that depicted at **23** and **230** for successive sharpening of the severed edge thereof and subsequent longitudinal severance of the sharpened edge zone to provide additional sharpened narrow ribbon blade strips until the final remainder base strip becomes so narrow that it no longer can be securely supported by guide means at additional abrasive wheel sharpening equipment.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in carrying out the above method without departing from the scope of the invention, it is intended that all matter contained in the above description shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claim is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. A method of making narrow ribbon blades of coilable type having a single cutting edge and which is of a width and such high flexibility as to make it very difficult for an unsharpened blank therefor to be guided securely and accurately through edge shaping and sharpening means, comprising providing a continuous supply strip of metallic blade material in a width at least a multiple of the width of the desired ribbon blade, such width of said supply strip being sufficient to assure secure guidance through edge shaping and sharpening means for sharpening one longitudinal edge thereof, passing said continuous supply strip through such shaping and sharpening means while sharpening thereby one longitudinal edge of said supply strip, continuously severing the resulting sharpened supply strip longitudinally along a line generally parallel to and spaced a short distance from the sharpened edge to sever from the supply strip the desired sharpened ribbon blade and to leave as a remainder a base strip which is of a width sufficient to assure secure and accurate guidance through edge shaping and sharpening means for sharpening one longitudinal edge thereof, passing said remainder base strip through additional edge shaping and sharpening means while sharpening thereby one longitudinal edge of said base strip, and continuously severing the resulting sharpened base strip longitudinally along a line generally parallel to and spaced a short distance from the sharpened base strip edge to sever another desired sharpened ribbon blade from the base strip.

References Cited

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1,734,554	11/1929	Behrman	76—104
2,290,964	7/1942	Hill	51—80
2,709,874	6/1955	Delafontaine	51—80

TRAVIS S. McGEHEE, Primary Examiner

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,468,195 Dated September 23, 1969

Inventor(x) George A. La Cas

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 39, for "progressive" read --progressive; column 2, line 60, for "stopping" read --stropping--; column line 72, for "sharepend" read --sharpened--; column 3, line for "sharpened thereby to the desired keenness. For this pu read --pose such strip guide means may include side guide rolls--; column 3, line 33, for "detained" read --detailed-- column 3, line 65, for "wheels being" read --wheels while being--; column 4, line 50, for "row blade" read --row ribbc blade--.

SIGNED AND
SEALED
JUN 16 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER,
Commissioner of Pate