March 26, 1963 R. TÖPFER 3,082,579

DEVICE FOR SHARPENING DOUBLE-EDGED RAZOR BLADES BY HAND

Filed May 31, 1961

FIG.4

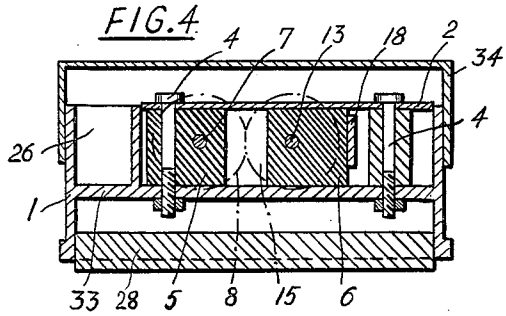


FIG.5

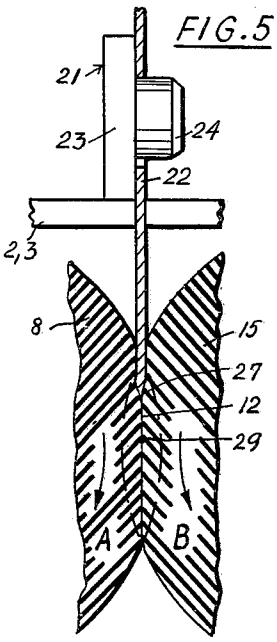


FIG.3

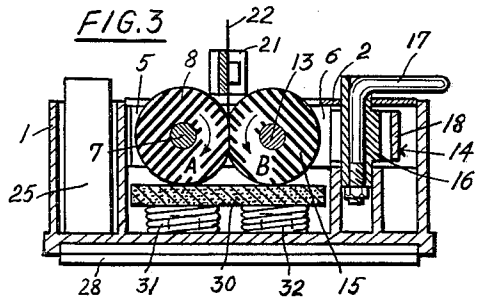


FIG.1

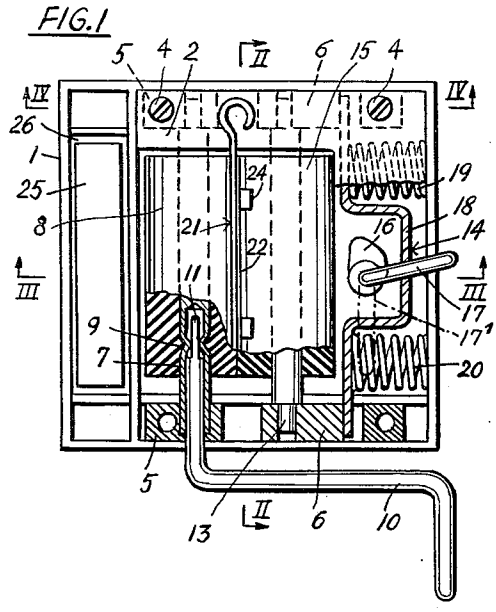
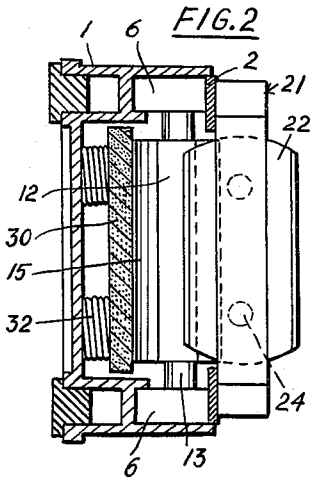


FIG.2



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DEVICE FOR SHARPENING DOUBLE-EDGED RAZOR BLADES BY HAND

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This invention relates to a device for sharpening double-edged razor blades by hand, which has a pair of grinding rollers contacting each other along their generatrices and rotatable in opposite directions and a holder for suspending a razor blade therein.

In the known sharpening devices two grinding rollers regrind the two ground bevels of one of the cutting edges of a razor blade either alternately or simultaneously.

In the first case the thin cutting edge which is formed by the ground bevels and terminates in a zero dimension does not possess the required inherent rigidity to withstand the unilateral grinding pressure. Regrinding is then only possible with a very high grinding speed and a very small grinding pressure. However, high grinding speeds of the grinding rollers cannot be attained by simple means.

In the second case the pair of grinding rollers contacting each other cannot accurately engage the acute-angled cutting edge.

To overcome the existing shortcomings, the invention provides a device for sharpening double-edged razor blades, in which a pair of rotatable grinding rollers is arranged to regrind simultaneously the two ground bevels of one of the cutting edges with low grinding speed and at the same time with great grinding pressure.

The device according to the invention comprises a housing, a pair of rails secured in said housing at two opposite sides thereof, a pair of counterrotating grinding rollers consisting of a rubber-elastic material and contacting each other along their generatrices, said grinding rollers being arranged between and at right angles said rails, an adjustable clamping device accommodated within said housing alongside one of said grinding rollers and arranged to produce flattened surfaces on and between said grinding rollers, and a detachable holder for suspending a razor blade therein, stably secured on said rails, one cutting edge of the suspended razor blade being engaged between the flattened surfaces of said grinding rollers and extending almost up to an imaginary longitudinal central line between said flattened surfaces.

The same degree of flattening of the flattened surfaces of the pair of grinding rollers is always ensured by pressing the grinding rollers against each other by the force of pressure springs. The grinding rollers thus provide the grinding pressure which can be adjusted by means of the pressure springs. No unilateral grinding pressure acts upon the cutting edge because the amount of pressure acting upon one of the two bevels of the cutting edge equals the amount of pressure acting upon the opposite bevel. On the rotation of the grinding rollers in opposite directions, the elastic grinding rollers, owing to their resiliency, fully engage the bevels and then the cutting edge.

The grinding rollers may consist of natural or synthetic rubber and an abrasion plate which is made of emery dust bonded with a binding agent may be arranged below the grinding rollers in such a manner that it is urged against the superficies of the grinding rollers with a small spring force and on rotation of the grinding rollers maintains same at equal level and at the same time produces a thin layer of emery dust on the superficies of the grinding rollers.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

FIG. 1 is a top plan view, partly in section, of a device according to the invention, with removed cover;

FIG. 2 is a vertical section taken on the line II—II of FIG. 1;

FIG. 3 is a vertical section taken on the like III—III of FIG. 1;

FIG. 4 is a vertical section taken on the line IV—IV of FIG. 1, and

FIG. 5 is a sectional view, on an enlarged scale, showing a razor blade engaged between compressed grinding rollers.

With reference now to FIG. 1, two rails **2** and **3** are secured by means of screws **4** in a housing **1** at two longitudinal sides thereof. Between the rails **2** and **3** and a bottom **33** (FIG. 4) of the housing **1** stationary bearings **5** are secured and shiftable bearings **6** are guided. In the stationary bearings **5** a tubular axle **7** of a grinding roller **8** is rotatable. The tubular axle **7** has a restricted portion **9** adjacent one of its ends. One end of a detachable crank handle **10** is provided with an elongation in the form of a pin **11** constructed at its free end as a screw driver blade and inserted in the tubular axle **7** so that the pin **11** projects into the restricted portion **9** of the tubular axle **7** and on turning the crank handle **10** the grinding roller **8** is rotated. In the shiftable bearings **6** an axle **13** of a grinding roller **15** is rotatable. The grinding rollers **8** and **15** contact each other along their generatrices and are arranged at right angles to the rails **2** and **3**.

The shiftable bearings **6** are engaged by an adjustable clamping device **14** having a cam **16** which is mounted on and adjustable by a control means, for example a lever **17**. The cam **16** is arranged to cooperate with a substantially U-shaped pressure member **18** of the clamping device acted upon by pressure springs **19** and **20**. The pressure springs **19** and **20** urge the pressure member **18** against the shiftable bearings **6** which in turn urge the grinding roller **15** against the grinding roller **8**. The grinding rollers **8** and **15** consist of natural or synthetic rubber, so that when the grinding roller **15** is pressed against the grinding roller **8**, flattened surfaces **12** are formed on the grinding rollers, as shown in FIG. 5. In a position 17^1 of the lever **17** the pressure member **18** opposes and reduces the force of the pressure springs **19** and **20** on the shiftable bearings **6** since it is moved away from the grinding roller **15** by the cam **16** and compresses the pressure springs **19** and **20**. Each time the grinding rollers **8** and **15** are in use the pressure springs **19** and **20** urge the pressure member **18** against the shiftable bearings **6** to the same extent whereby always the same degree of flattening of the flattened surfaces **12** is obtained and this flattening is cancelled when the grinding rollers are not in use.

On the rails **2** and **3** there is stably secured a detachable holder **21** for a razor blade **22**. As can be seen from FIG. 5, the holder **21** comprises a holding strip **23** with holding pins **24**.

As shown in FIG. 3, an abrasion plate **30** made of emery dust bonded with a binding agent is arranged below the grinding rollers **8** and **15** in such a manner that it is urged against the superficies of the grinding rollers **8** and **15** by pressure springs **31** and **32**. On rotation of the grinding rollers **8** and **15** the abrasion plate **30** maintains the grinding rollers at equal level and produces a thin layer of emery dust on the superficies of the grinding rollers, which serves for regrinding the bevels of the cutting edges of the razor blade. This layer of emery dust adheres well to the superficies of the grinding rollers **8** and **15** since the fine grains of emery dust are retained in the rubber of which the grinding rollers are made.

As shown in FIG. 4, a hollow space **26** is provided in the housing **1** for accommodating a razor blade maga-

zine 25 (FIGS. 1, 3) serving to protect the cutting edges of the stored razor blades. To the underside of the housing 1 a soft anti-slip base plate 28 is attached. The top of the housing 1 is closed by a cover 34 which can only be applied when the lever 17 is in the position 17^1.

In FIG. 5 the razor blade 22 is suspended in the holder 21. One cutting edge 27 of the razor blade 22 is engaged between the flattened surfaces 12 of the grinding rollers 8 and 15 and extends almost up to an imaginary longitudinal central line 29 between the flattened surfaces 12. When the crank handle 10 is turned in the direction of arrow A (FIGS. 3 and 5), the grinding roller 8 is rotated in the same direction. The two grinding rollers 8 and 15 are coupled owing to the frictional contact between the flattened surfaces 12, so that the grinding roller 15 rotates in the direction of arrow B. The cutting edge 27 of the razor blade 22 engaged between the flattened surfaces 12 is reground on rotation of the grinding rollers 8 and 15 and thus sharpened.

When the crank handle 10 is turned in opposite direction, the razor blade 22 is ejected from between the flattened surfaces 12 of the grinding rollers 8 and 15 due to the frictional force without the cutting edge 27 of the razor blade being damaged. After the resharpening of the cutting edge 27 is finished, the holder 21 with the razor blade 22 suspended therein is turned through an angle of 180° and the other cutting edge of the razor blade is sharpened in the same manner.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

I claim:

1. A device for sharpening double-edged razor blades comprising a housing, a pair of rails secured in said housing at two opposite sides thereof, a pair of counter-rotating grinding rollers consisting of an elastic material and contacting each other along their generatrices, said grinding rollers being arranged between and at right angles to said rails, an adjustable clamping device accommodated within said housing alongside one of said grinding rollers and arranged to produce flattened surfaces on and between said grinding rollers, and a detachable holder for suspending a razor blade therein, said holder being stably secured on said rails, one cutting edge of the suspended razor blade being engaged between the flattened surfaces of said grinding rollers and extending almost down to an imaginary longitudinal central line between said flattened surfaces, said adjustable clamping device comprising a control means having a cam, a pressure member, and pressure springs which act on the pair of grinding rollers through the intermediary of the pressure member, the pressure springs being arranged to compress the grinding rollers at the opposed superficies thereof on operation of the control means to form the flattened surfaces on the grinding rollers and the cam of the control means being arranged to oppose and reduce the effective tension of the pressure springs.

2. A device as claimed in claim 1, wherein the control means comprises a lever.

3. A device for sharpening double-edged razor blades comprising a housing, a pair of rails secured in said housing at two opposite sides thereof, a pair of counter-rotating grinding rollers consisting of an elastic material and contacting each other along their generatrices, said grinding rollers being arranged between and at right angles to said rails, an adjustable clamping device accommodated within said housing alongside one of said grinding rollers and arranged to produce flattened surfaces on and between said grinding rollers, a detachable holder for suspending a razor blade therein, said holder being stably secured on said rails, one cutting edge of the suspended razor blade being engaged between the flattened surfaces of said grinding rollers and extending almost down to an imaginary longitudinal central line between said flattened surface, and an abrasion plate which is made of emery dust bonded with a binding agent is disposed below the grinding rollers, means mounting said abrasive plate and urging the same against the superficies of the grinding rollers with a small spring force whereby on rotation of the grinding rollers said abrasive plate maintains an equal level and at the same time produces a thin layer of emery dust on the superficies of the grinding rollers.

4. A device as claimed in claim 3, wherein the elastic material of which the pair of grinding rollers is made is natural rubber.

5. A device as claimed in claim 3, wherein the elastic material of which the pair of grinding rollers is made is synthetic rubber.

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