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(54) **DEVICE FOR GRINDING OF SKI SOLES**

VORRICHTUNG ZUM SCHLEIFEN VON SKIERN

DISPOSITIF POUR RECTIFIER DES SEMELLES DE SKI

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Description

[0001] The present invention relates to a device for grinding of the soles of skis according to the introduction of claim 1.

[0002] Several different devices for grinding of patterns in ski soles are previously known. Examples of such devices are, for example, Wintersteiger Sigma RS350 from the company Wintersteiger AG in Austria, Reichmann Profi B350 from the company Reichmann Skiservice, Germany and Montana Crystal from the firm Montana Sport International AG, Switzerland.

[0003] Common to all these known devices is that a grinding stone is used for grinding a pattern into the sole of a ski, and that the ski moves gradually into the grinding apparatus during the grinding process.

[0004] In addition, a number of different apparatus for the grinding of skis and structuring of the grindstone are known. Examples of such known solutions are, for example, WO-A1 99/36227, EP-B1 1 179 391, US-A1 4 881 347, DE-A1 43 21 450, EP-A1 1 685 880, FR-A1 2 230 385 and U.S. 4 679 356 A1.

[0005] A waxing machine for skis from www.montana-international.com is known, where the ski is at rest while the waxing machine moves relative to the ski.

[0006] A disadvantage with these known grinding devices, is that the grinding stone which is used, will gradually be worn down, which means that it is difficult to achieve reproducible results. Even if one sets up the stone again (grind it up again), the surface will not be the same as the first time, so that the grinding of the ski will be different than before. Thus you will not be able to repeat a successful grinding and chance determines whether the grinding will be only useful, or whether it will be very good.

[0007] Another disadvantage with this is that peripheral speed of the grinding stone will change as the grindstone wears down, because the radius will gradually be reduced. Another disadvantage with the known devices is that the ski is moving in the grinding apparatus during the grinding process. This will inevitably result in the ski moving sideways to a certain degree, so that the grinding is not sufficiently accurate. The sidewise movement will vary every time the ski is led through the grinding machine.

[0008] Document FR1594036 discloses a device according to the preamble of claim 1.

[0009] The present invention intends to provide a device of the initially mentioned type, where the above mentioned disadvantages are not present, or are at least substantially reduced.

[0010] Tests have shown that skis ground with a device in accordance with the invention, provide better results as well as more reproducible results than the grinding performed with the previously known grinding machines.

[0011] This is achieved with a device for grinding the soles of the ski, said device incorporates a grinding unit, a device for holding/clamping the ski and a foundation for support of the grinding device, wherein the grinding unit encompasses a grinding wheel made from a metallic material, and that the grinding unit and the device that holds/clamps the ski, in the longitudinal direction of the ski, is set up to make a relative movement, and that the grinding wheel rotates with a peripheral speed which is different from the speed of the relative movement.

[0012] The relative movement is produced either in that the grinding unit moves and the ski is held stationary or in that the grinding unit is held stationary and the ski moves.

[0013] The grinding unit includes a sensor and a regulating appliance to regulate the force of the grinding wheel against the sole of the ski.

[0014] The grinding unit preferably includes a sensor and a regulating appliance for regulating the force of the grinding wheel against the sole of the ski.

[0015] The foundation is fitted with rails or the like in the longitudinal direction of the ski and the grinding unit is fitted with complementary shaped wheels or engagement bodies to cooperate with the rails.

[0016] Furthermore, the device can be fitted with a drive appliance, for example, in the form of a toothed rack, a screw rod or a chain, linked to a motor, so that the grinding unit can be moved in the longitudinal direction of the ski.

[0017] The invention will be explained in more detail in the following with the help of an embodiment example with reference to the enclosed drawings, in which

Fig. 1 shows a perspective sketch of an embodiment of a grinding machine according to the present invention.

Fig. 2 shows the grinding machine in fig. 1 seen from above,

Fig. 3 shows a detail of the grinding machine according to figs. 1 and 2, Figure 4 shows a detail of the grinding device,

Fig 5 shows the grinding device seen from the side, with the covers removed.

[0018] Figure 1 shows an apparatus 1 for the grinding of the soles of skis in accordance with the present invention. The grinding machine 1 comprises a holding and clamping appliance 2 for the ski 3 that is to be ground, a base 4 and a movable grinding unit 5. As shown in fig. 2 the grinding unit (the grinding head) 5 is mounted on rails 6 so that it can move horizontally. The grinding unit 5 is linked to a motor 8 via a drive appliance 7, for example, a toothed rack, a screw rod or a chain, so that the grinding unit 5 can move horizontally. The ski 3 is secured in the holding and clamping appliance 2 so that it can be adjusted with the help of a number of adjustable rollers 9 fitted onto the appliance 2. This is shown in fig. 3 in more detail.

[0019] The grinding device 5 is shown in more detail in fig. 4, where a part of the covers in fig. 1 is removed. The grinding unit 5 comprises a rotary grinding wheel 10 with associated drive appliance (not shown). Furthermore, the drive appliance is shaped so that the grinding wheel can be adjusted vertically.

[0020] Contrary to the previously known solutions described above, the grinding wheel 10 is made of metal. The purpose of this is to reduce the wear on the grinding wheel 10 to a minimum so that reproducible results can be obtained. Furthermore, the drive appliance of the grinding wheel 10 is set up so that it regulates the pressure of the grinding wheel against the base of ski 3 all the time. In this way, it is possible to achieve a uniform grinding across the whole length of the ski 3.

[0021] The grinding wheel can be fitted with different types of grooves in the wheel surface, for example, a helical groove that extends one or more times around the grinding wheel from the one side of the wheel to the other, diagonal grooves that stretch across from one edge of the grinding wheel to the other or a combination of different grooves. These grooves can, for example, be milled or machined into the grinding wheel and it will be possible to vary them to provide a desired grinding result. Since the grinding wheel is made of metal, the grinding wheel will not wear significantly as a result of the use against the relatively soft ski soles and the grinding result will be repeatable even over a long time.

[0022] The grinding head can be equipped with a pressure sensor which ensures that the grinding wheel is pressed against the ski sole at a predetermined constant pressure.

Claims

1. Device (1) for grinding the soles of skis (3), said device comprising a grinding unit (5), an appliance (2) to hold/clamp the ski and a foundation (4) for the support of the grinding device (1), the grinding unit (5) comprising a grinding wheel (10), the grinding unit (5) and the appliance (2) that holds/clamps the ski (3) in the longitudinal direction of the ski (3), being set up to perform a relative movement, the grinding wheel (10) rotating with a peripheral speed which is different from the speed of the relative movement **characterised in that** the grinding unit (5) comprises a grinding wheel (10) made from a metallic material.

2. Device (1) according to claim 1, **characterised** i n that the relative movement is brought about in that the grinding unit (5) moves and that the ski is held stationary.

3. Device according to claim 1, **characterised in that** the relative movement is brought about **in that** the grinding unit (5) is held stationary and that the ski (3) moves.

4. Device (1) according to any of the claims 1 to 3, **characterised** i n that the grinding unit (5) includes a sensor and a regulating appliance for regulating of the force of the grinding wheel (10) against the sole of the ski (3).

5. Device according to any of the preceding claims, **characterised** i n that the foundation (4) is fitted with rails or the like (6) in the longitudinal direction of the ski (3) and that the grinding unit (5) is provided with complementary shaped wheels or engagement bodies for cooperation with the rails (6).

6. Device according to any of the preceding claims, **characterised** i n that the device (1) is fitted with a drive appliance (7), for example, in the form of a toothed rack, a screw rod or a chain, linked to a motor (8) so that the grinding unit (5) can move in the longitudinal direction of the ski (3).

Patentansprüche

1. Vorrichtung (1) zum Schleifen der Laufflächen von Ski (3), wobei die Vorrichtung eine Schleifeinheit (5), eine Einrichtung (2) zum Halten/Spannen des Skis und einen Unterbau (4) zum Stützen der Schleifvorrichtung (1) umfasst, wobei die Schleifeinheit (5) ein Schleifrad (10) umfasst, wobei die Schleifeinheit (5) und die Einrichtung (2), welche den Ski (3) in der Längsrichtung des Skis (3) hält/klemmt, aufgebaut sind, um eine Relativbewegung durchzuführen, wobei das Schleifrad (10) mit einer Umfangsgeschwindigkeit rotiert, welche sich von der Geschwindigkeit der Relativbewegung unterscheidet, **dadurch gekennzeichnet, dass** die Schleifeinheit (5) ein aus metallischem Material hergestelltes Schleifrad (10) umfasst.

2. Vorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Relativbewegung dadurch bewirkt wird, dass sich die Schleifeinheit (5) bewegt, und dass der Ski stationär gehalten wird.

3. Vorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Relativbewegung dadurch bewirkt wird, dass die Schleifeinheit (5) stationär gehalten wird, und dass sich der Ski (3) bewegt.

4. Vorrichtung (1) nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Schleifeinheit (5) einen Sensor und eine Reguliereinrichtung zum Regulieren der Kraft des Schleifrads (10) auf die Lauffläche des Skis (3) enthält.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Unterbau (4) in der Längsrichtung des Skis (3) mit

Schienen oder dgl. (6) ausgerüstet ist, und dass die Schleifeinheit (5) mit komplementär geformten Rädern oder Eingriffskörpern zum Zusammenwirken mit den Schienen (6) versehen ist.

6. Vorrichtung nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Vorrichtung (1) mit einer Antriebseinrichtung (7), zum Beispiel in Form einer Zahnstange, einer Gewindestange oder einer Kette, ausgerüstet ist, welche so mit einem Motor (8) verbunden ist, dass sich die Schleifeinheit (5) in der Längsrichtung des Skis (3) bewegen kann.

Revendications

1. Dispositif (1) pour rectifier les semelles de skis (3), ledit dispositif comprenant une unité de rectification (5), un appareil (2) pour maintenir/serrer le ski et une fondation (4) pour le support du dispositif de rectification (1), l'unité de rectification (5) comprenant une meule (10), l'unité de rectification (5) et l'appareil (2) qui maintient/serre le ski (3) dans la direction longitudinale du ski (3) étant conçus de manière à exécuter un déplacement relatif, la meule (10) tournant avec une vitesse périphérique qui est différente de la vitesse du déplacement relatif, **caractérisé en ce que** l'unité de rectifcation (5) comprend une meule (10) qui est constituée d'un matériau métallique.

2. Dispositif (1) selon la revendication 1, **caractérisé en ce que** le déplacement relatif est opéré de telle sorte que l'unité de rectification (5) se déplace et que le ski soit maintenu stationnaire.

3. Dispositif selon la revendication 1, **caractérisé en ce que** le déplacement relatif est opéré de telle sorte que l'unité de rectification (5) soit maintenue stationnaire et que le ski (3) se déplace.

4. Dispositif (1) selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** l'unité de rectification (5) comprend un capteur et un appareil de régulation pour réguler la force de la meule (10) contre la semelle du ski (3).

5. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la fondation (4) est équipée de rails ou analogues (6) dans la direction longitudinale du ski (3) et **en ce que** l'unité de rectification (5) est équipée de roues ou de corps d'engagement de forme complémentaire destinés à coopérer avec les rails (6).

6. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le dispositif (1) est pourvu d'un appareil d'entraînement (7), par exemple, sous la forme d'une crémaillère, une tige filetée ou une chaîne, relié à un moteur (8) de telle sorte que l'unité de rectification (5) puisse se déplacer dans la direction longitudinale du ski (3).

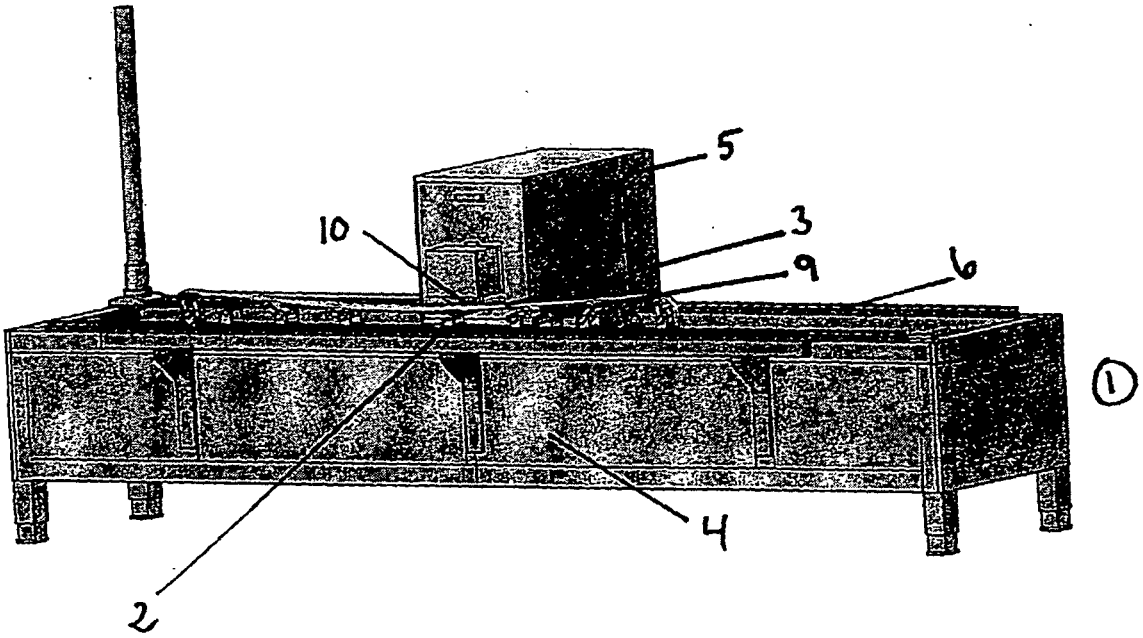


FIG. 1

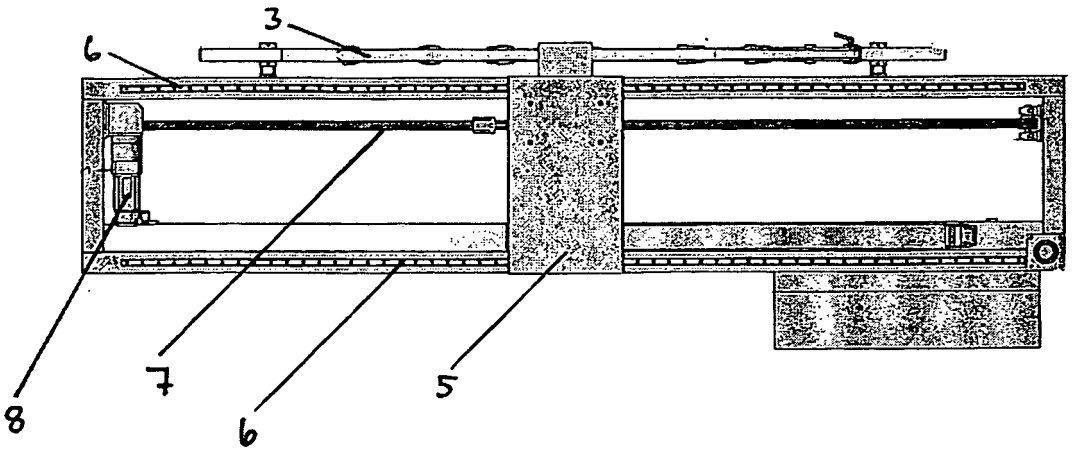


FIG. 2

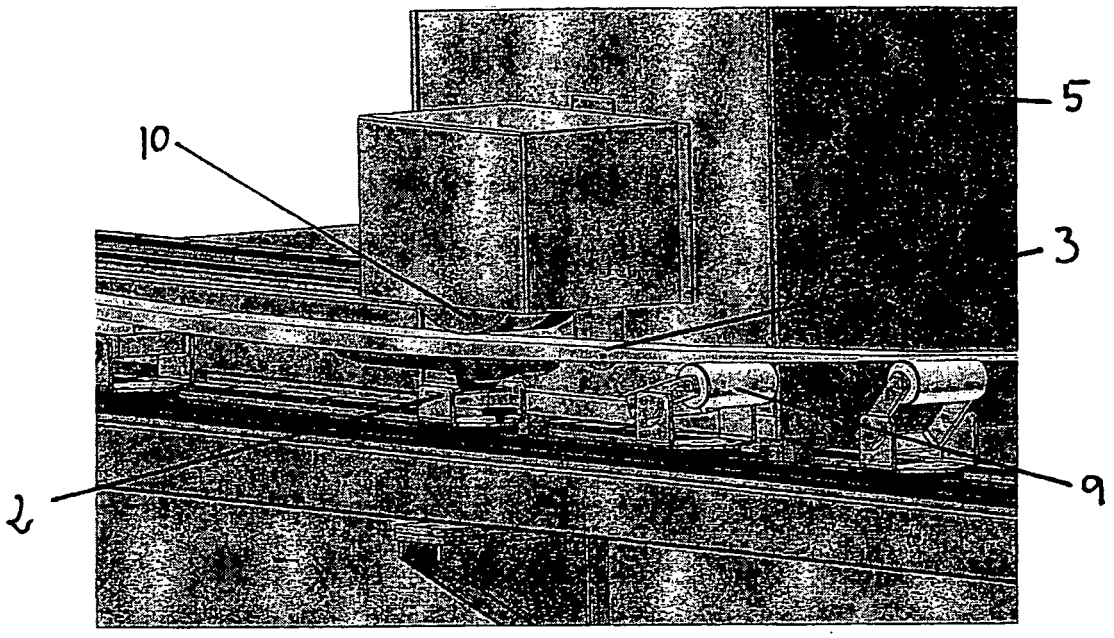


FIG. 3

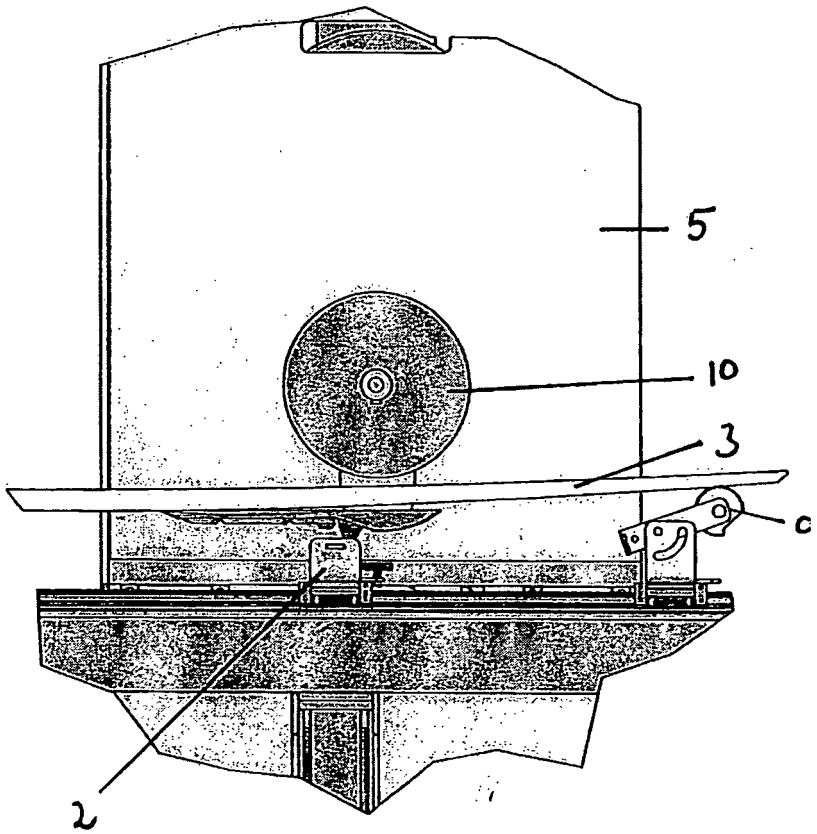


FIG. 4

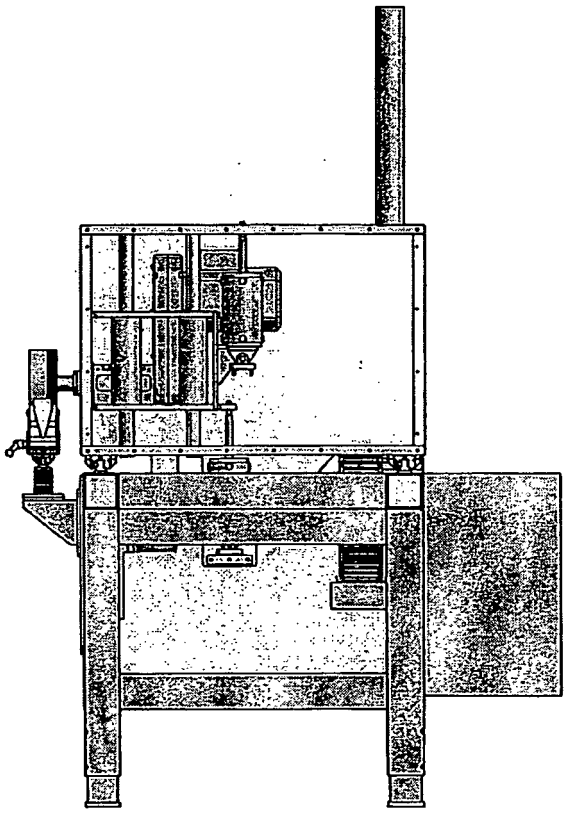


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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