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[33] **Germany**

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[54] **ASSEMBLY BENCH, ESPECIALLY FOR SKI BINDINGS AND SKI REPAIRS**
 8 Claims, 5 Drawing Figs.

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 269/254, 269/307

[51] Int. Cl..... **B25b 1/16**

[50] Field of Search..... 269/153,
 157, 158, 159, 254, 307

ABSTRACT: An assembly bench for the mounting of bindings and ski repairs, which comprises holding means with two clamping jaws on each side of the assembly bench and with an intermediate spacer, the clamping jaws which are spring urged so as to be under pull stresses, are by means of a foot lever and through the intervention of a spreader linkage adapted to be spread apart, said assembly table having associated therewith a measuring device.

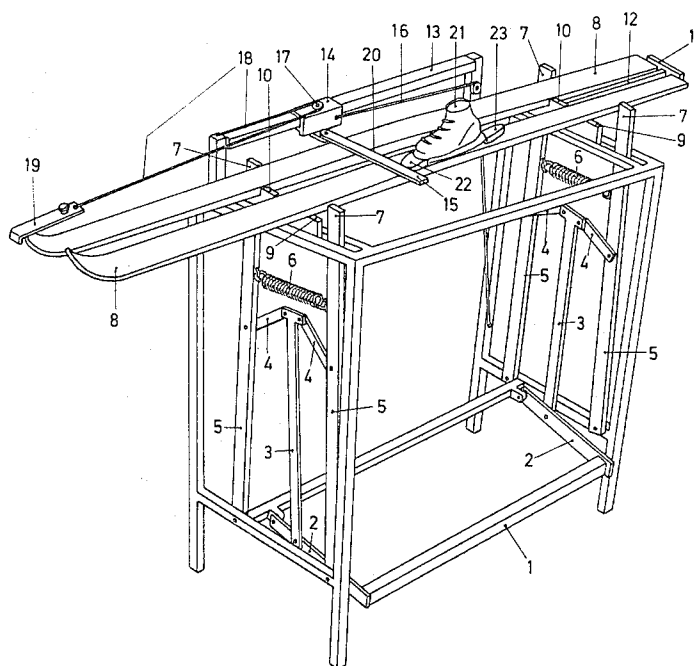
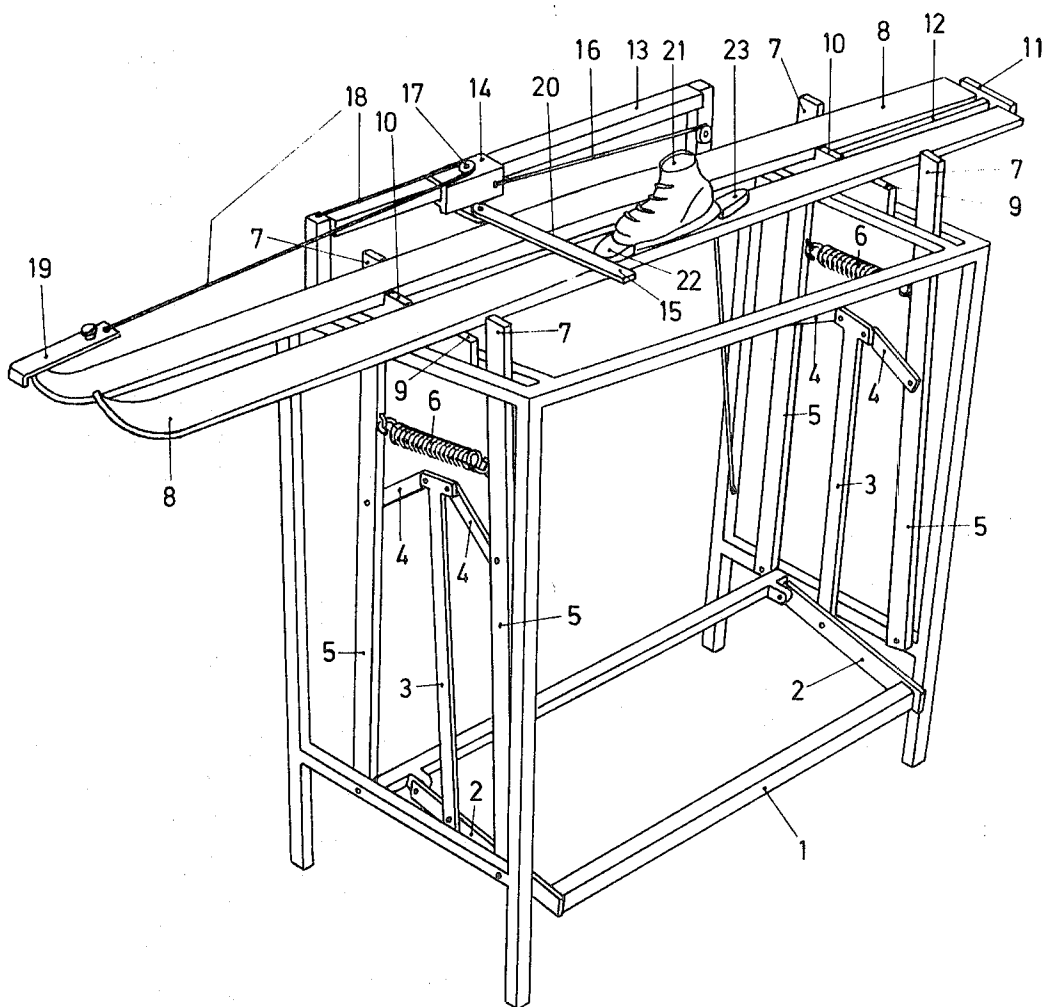


Fig. 1



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Fig. 2

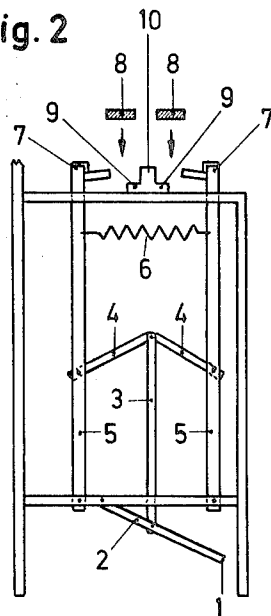


Fig. 3

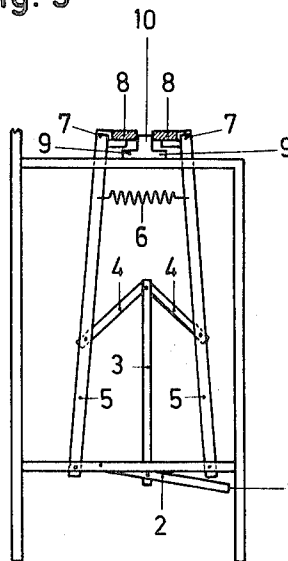


Fig. 4

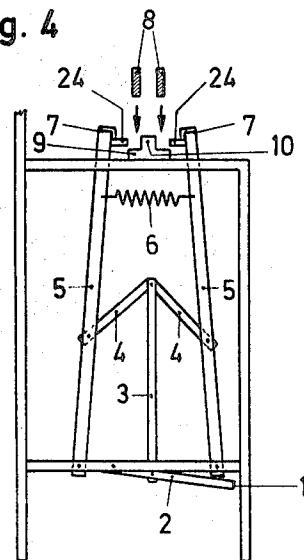
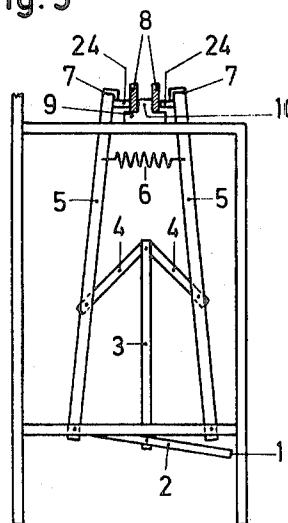


Fig. 5



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ASSEMBLY BENCH, ESPECIALLY FOR SKI BINDINGS AND SKI REPAIRS

The present invention relates to an assembly bench for assembling ski bindings and for carrying out ski repairs while being provided with holding means for the workpiece. Such holding means comprise two clamping jaws on each side of the assembly bench which have their upper ends provided with clamping spars or trails. The said assembly bench furthermore comprises intermediate spacer means while the clamping jaws are spring-urged so as to be under pull stress and are adapted to be spread apart by a foot lever. An assembly bench of the above-mentioned type furthermore comprises a measuring device and adjusting means for adjusting the shoe size.

With the heretofore known assembly benches for the assembly of ski bindings and for repairing skis, the holding means are actuated by compressed air cylinders so that an air compressor with a compressed air reservoir or accumulator as well as a current connection is necessary whereby the cost for the assembly bench is greatly increased.

It is, therefore, an object of the present invention to provide an assembly bench which will overcome the above-mentioned drawbacks.

It is another object of this invention to provide an assembly bench which is simple in construction and in which the mechanical actuating means operate in an economical manner, with high precision and without any material noise. These and other objects and advantages of the invention will appear more clearly from the following specification, in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of an assembly bench according to the present invention.

FIGS. 2 and 3 are views of the assembly bench of FIG. 1 and respectively showing skis shortly before insertion of both skis as well as with skis in clamped position.

FIGS. 4 and 5 are side views of the assembly bench showing that both skis vertically can also be installed in the assembly bench. FIG. 4 illustrates positioning prior to insertion of the skis and FIG. 5 illustrates the operating position upon clamping of the skis.

The assembly bench according to the present invention is characterized by holding means with two clamping jaws on each side of the assembly bench and with intermediate spacer means, said clamping jaws which are spring-urged so as to be under pull tension being adapted to be spread apart by means of a foot lever and a spreader linkage. Furthermore, there is provided a measuring device which is arranged above the assembly bench.

In conformity with the present invention, the clamping jaws with diametrically oppositely located clamping trails or spars are so arranged that they will center themselves by actuation of a foot lever while the said intermediate spacer means are displaceable between said clamping trails.

According to a further feature of the present invention, the measuring device comprises a flexible ruler located in a block and provided with two roller means, said ruler being displaceable in said block. The block is slidable back and forth on a carriage in a ruler guiding rail. The said carriage is adapted by means of a pull rope or cable and a front abutment to be moved by means of a roller in one direction and is furthermore adapted by means of a roller and a counterweight to be returned in the other direction by means of a deviating roller or a tension spring means.

The assembly bench rests on four feet adapted to be adjusted as to height.

The front abutment of the measuring device serves as adjustment for the shoe size. The pull cable or rope is preferably of a nonextensible material.

Referring now to the drawings in detail, the assembly bench illustrated in FIGS. 1 and 2 comprises a foot lever 1 which is connected to two lateral push rods 2. Respectively connected to each of said push rods 2 is a pull rod 3, the upper ends of which have loosely journaled therein a spreader linkage 4. The spreader linkage 4 extends on each side of the assembly bench at an incline in downward direction and is movably connected

to the clamping jaws 5. The clamping jaws 5 are in pairs on each side of the assembly bench held under continuous pull tension by spring 6 so as to be urged toward each other. The spreader linkage 4 is by means of a rod 7 laterally stabilized. The upper ends of the clamping jaws 5 have arranged thereon clamping spars or clamping trails 8 which preferably are covered with a soft layer so as not to mar the article being repaired. Between the clamping trails 8 there are provided intermediate spacer means 9 which are displaceably located. By the displaceability of the spacer means 9 and in view of the downwardly inclined spreader linkage 4 which is connected to the clamping jaws 5, a self-centering of the holding means will be assured when actuating the foot lever 1. Above the assembly bench 10 there is provided a measuring device with a ruler 12.

The four legs of the assembly bench are, as indicated in the drawings, adjustable as to height by means of bores and pegs or may be adjustable by a worm thread.

At the rear of the assembly bench 10, and more specifically, above the assembly table 10 there are provided means for depositing working tools and the like.

The measuring device illustrated in FIG. 1 comprises a flexible ruler 12 which is displaceable in a block 13 by means of a slide fit and which is adjustable and resettable for stabilizing the lateral guiding means. The block 13 is provided on a carriage 14 which is displaceable back and forth on ruler guiding rail means 15. In block 13, at the lower end there are rotatably journaled two diametrically oppositely located rollers 16, 17, the roller 16 serving as pulling roller and the roller 17 serving as returning roller. A pull cable 18 which passes over the roller 16 has one end connected to the left side of the ruler guiding rail 15. The other end of the pull cable 18 has connected thereto adjusting means for adjusting the shoe size, the said adjusting means serving as a front abutment 19. A return cable 20 passes over the roller 17 and a reversing roller 27. The return cable 20 has one end connected to the right-hand side of the ruler guiding rail 15 and is by means of a counterweight 21 held under continuous pull stress. The pull cable 18 and the return cable 20 advantageously consist of nonextensible material, preferably of steel bowden wires or of link chains in order to prevent faulty measurements which could be caused by an expanding cable.

If the function of the counterweight 21 is to be replaced by a tension spring device (not shown in the drawings) the roller 17 and the roller 27 become superfluous. The tension spring device will then have one end connected where the roller 17 was previously located and have its other end connected where the reversing roller 27 was previously located.

When employing the measuring device referred to above in connection with the assembly bench according to the invention, the measuring device is, by means of spars 22, 23, to be connected above the assembly bench 10 in such a way that the ruler 12 will be able to slide over skis clamped into the assembly bench.

When employing the measuring device according to the invention with the assembly bench or with the assembly table, the measuring device is, by means of a spacer block 25 and a rear abutment 24, connected to the wall. In order to find the necessary assembly points for assembling the ski bindings, the skiers are held in engagement with the rear abutment in such a way that the ruler 12 can slide above the skis back and forth. When the ruler 12 is adjusted to half the ski height which normally forms the starting point for the assembly of the ski binding, the looked-for assembly point is after the shoe size adjustment is adjusted on the abutment 19 for the desired shoe size, precisely and safely ascertained by a single manipulation, namely, by suspending the front abutment above the tip of the ski to be handled or machined. The ruler 12 will then together with the carriage 14 and block 13 have moved to that portion of the ski where the assembly point to be ascertained will be located for the ski binding while considering the size of the shoe.

Inasmuch as each ski type has its own problems and properties, different valuations will be obtained when fixing the respective correct assembly point. By means of a scale 26 provided on the ruler 12, comprising three slots, it will be possible immediately to read the assembly point also for special purposes of employment of a ski type, after the abutment 19 protrudes beyond the ski tip.

FIG. 1 represents a perspective view of the assembly bench with the skis clamped therein. The FIGS. 2 and 3 show at a time the side view of the assembly bench whereby in FIG. 2 the operation positioning is illustrated shortly before insertion of both skis and in FIG. 3 the operation position illustrated represents the skid clamped in position. FIGS. 4 and 5 show that both skis with high edges or vertically can also be installed in the assembly bench whereby FIG. 4 illustrates the operation positioning prior to insertion of the skis and FIG. 5 illustrates the operating position upon clamping of the skis.

The manner of operation of the assembly bench is as follows: By way of stepping down on the pedal or foot lever 1, there is downward movement of pull rods 3 by way of the pedal lever means or push rod 2. Each pull rod is connected with two thrust plates which with their other end are linked to handles or spars of which the lower ends are pivotally journaled on the assembly bench. By way of the downward movement of the pull rods 3, both spars or jaws 5 on each side of the assembly bench are swung or pivoted away from each other against the force of springs 6 by way of the knee-leverlike effective thrust plates or linkage 4 as indicated in FIG. 2.

Thereupon both skis 8 with their running surface directed downwardly can be inserted between the ends 7 of the spars or jaws 5 projecting upwardly over the assembly bench and the distance pieces (assembly table) 10 of the assembly bench having support spacer means 9 therewith.

Thereby the skis 8 are shifted or pushed with their rear ends against a straightening or orientation abutment 11 which is in solid connection with the assembly bench in that the same is secured therewith by way of a rod or bar 11'.

After the skis 8 are oriented or aligned at the abutment 11, the foot lever or pedal is released so that the spars or jaws pivot or swing by way of the force effectiveness of the springs 6 in a direction against the distance pieces (assembly table) 10 carrying support spacer means 9. As recognizable from FIG. 3, the free ends 7 of the spars or jaws 5 press thereby against the outer side edges of the skis 8 and push or shift the same with their inner edges against the distance pieces (assembly table) 10. Hereby both skis 8 are simultaneously clamped upon the assembly bench adjacent to each other as shown by FIG. 3.

On the back or rear side of the assembly bench, there is secured a guide track or block 13 which lies in a higher plane than the upper side of the clamped ski means 8. A sled or carriage 14 can be shifted along this guide track or block 13 and the carriage 14 carries a ruler means 15 transversely to the longitudinal axis of the ski means 8. A cable line or tackle 16 loaded or biased by way of a weight or a strong rubber elastic or webbing engages trying to pull the carriage 14 to the right end of the guide track or block 13. A pull cable 18 is placed about a roller 13 rotatably journaled upon the carriage and one end of the pull cable 18 is anchored at the left end of the guide track or block 13. On the likewise leftward-guided second end of the pull cable 18 there is connected an abutment of engagement angle 19 which proceeds to the blade or scoop end respectively capable of being inserted upon the ski tip or point as can be recognized from FIG. 1.

The length of the pull cable 18 on one hand and the adjusting path of the carriage 14 on the other hand is so selected with respect to the position of the fixed aligning or orientation abutment 11 that the ruler 15 with its marked edge 20 always adjusts itself upon that location of the ski means 8 at which the tip of the ski boot 21 must stand upon the ski means 8. With the aid of the ruler 15 a marking is brought about upon both ski means 8. Thereupon, the toe jaws 22 of the binding are brought about upon these markings and are assembled upon the securely clamped ski means 8. Thereupon in dependence

upon the length of the ski boot 21 at a particular time, the heel jaws 23 of the binding are brought about and likewise fastened upon the ski means 8.

By way of stepping down upon the foot lever or pedal 1 there is finally brought about movement of the ends 7 of the spars 5 out of the clamping position according to FIG. 3 into the releasing position according to FIG. 2 so that the ski means 8 with the connection or binding means 22, 23 assembled thereon can be taken or removed from the assembly bench.

The FIGS. 4 and 5 make it clear that both ski means 8 also can be clamped to lie with the high edge or vertical positioning and with their running soles directed against each other between the distance pieces 10 and the free end 7 of the spars 5 when, for example, assembly or repair work is to be carried out on the ski side edges.

Also, in this case, there is movement of the free ends 7 of the spars or jaws 5 away from the distance pieces 10 by way of the stepping down upon the foot lever or pedal 1 as recognizable from FIG. 4. Then both ski means 8 are placed from above upon the supporting spacer means 9 and finally the pedal or foot lever 1 is released. The springs 6 pull the spars or jaws against each other so that fingers 24 located on the inner side of the spars or jaws press against the ski means 8 and securing the same between the foregoing and the distance pieces 10 as recognizable from FIG. 5. Working of the clamped ski means can then occur or assembly work can be carried out with respect thereto.

The present invention is, of course, not limited to the particular showing in the drawings, but also comprises modification within the scope of the appended claims.

What I claim is:

1. An assembly bench for carrying out assembly of ski bindings and for carrying out ski repairs comprising frame means with an assembly table for ski support during procedure of making bindings and ski repairs, which includes: holding means for orienting and securing skis on the assembly table respectively arranged at both ends of said bench and respectively comprising a pair of clamping jaws, spacer means respectively associated with said holding means and arranged between the respective clamping jaws pertaining to said holding means, spring means respectively associated with said holding means and biasing toward each other the clamping jaws of the pair of clamping jaws pertaining to the respective holding means, control means operatively connected to said holding means and operable selectively to move the clamping jaws of said pairs of clamping jaws away from each other against the thrust of said spring means, and measuring means arranged above said assembly table and including at least an abutment for a rear ski end as well as a marking element for a binding position whereby said measuring means determines the binding position location upon a ski dependent upon ski length and shoe size.

2. An assembly bench according to claim 5, and in which said control means includes a foot-operable jaw spreading linkage system and roller means journaled on said carriage means, said second cable means being diverted around said roller means and extending in a direction opposite to that of said first cable means.

3. An assembly bench according to claim 1, in which the clamping jaws of each pair of clamping jaws are supported equally high as provided with oppositely located clamping trails operable in a self-centering manner in response to the actuation of said control means, said spacer means between the respective clamping jaws being freely displaceably arranged.

4. An assembly bench according to claim 1, in which said measuring means includes: rail means supported by said frame means, carriage means displaceably arranged on said rail means, ruler means transverse to longitudinal ski direction supported by and displaceable in said carriage means, and means operatively connected to said carriage means for selectively moving said carriage means in either direction.

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5. An assembly bench according to claim 4, in which said means for selectively moving said carriage means in either direction includes: first cable means operatively connected to said carriage means and movable abutment means connected to said first cable means adjustable to ski length, and second cable means operatively connected to said carriage means and means continuously exerting a pulling force upon said second cable means.

6. An assembly bench according to claim 5, in which said

movable abutment means is formed by a shoe size measuring device.

7. An assembly bench according to claim 5, in which said first and second cable means consist of substantially un-stretchable material.

8. An assembly bench according to claim 1, in which said frame means includes legs adjustable as to height.

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