ABSTRACT OF THE DISCLOSURE

In a garniture for use in a machine for producing a rod of cigarette tobacco or of smoke-filtering material, the tongue, short folder and long folder are mounted upon a common base in relation to which their horizontal positions, in longitudinal and transverse directions, are preset accurately, but the position in the vertical direction of at least the long folder is made readily adjustable. The position in the vertical direction of the tongue is also made readily adjustable.

This invention concerns improvements relating to garnitures conventionally used in continuous cigarette-rod or filter-rod making machinery, i.e., that part of such machinery in which a continuous web of paper is folded around a continuous stream of tobacco shreds or of filamentary or sheet material to form a continuous cigarette- or filter-rod.

The garniture has three members generally known, in order of the movement of the said web, as the tongue, the short folder and the long folder.

It is a disadvantage of the currently usual arrangement of these three members that they are mounted so that each can be independently translated horizontally, as well as vertically, and can also be independently turned about horizontal and vertical axes, although it has been shown by experiment that it is important, for good and consistent rod production, that the horizontal and transverse position of all three members should be fixed before the machine is set up, accurate initial setting of some of at least the members being essential for continuously good results. Once optimum horizontal setting has been obtained, no further manipulation in the horizontal plane is desirable.

In use, this current usual arrangement provides considerable risk of important fixed settings being misaligned originally or altered deleteriously by the machine operator when the machine is in use. The important correct alignments of the tongue and the short folder are difficult to achieve and in addition, adjustment means are provided to alter the angle of the short folder during operation of the machine, although the slope of this member should be constant for consistent results. In many such garnitures the long folder, for example, has the disadvantage that correct adjustment of four screws is necessary on every occasion that vertical adjustment is required. Additionally, the transfer of this conventional garniture from one machine to another involves the individual removal and re-arrangement of each of the three components.

In the garniture according to the present invention, the tongue, short folder and long folder are mounted upon a common base in relation to which their horizontal positions in the longitudinal and transverse directions are preset accurately, but the position in the vertical direction of at least the long folder is made readily adjustable. Preferably, the position in the vertical direction of the tongue is also made readily adjustable. Advantageously the means for the vertical adjustment of the long folder and/or the tongue includes a calibrated scale by reference to which the adjustment can be effected. Accurate pre-setting in the horizontal plane will ensure that the rod of tobacco or filter material is positioned centrally and parallel to the axis of the usual semi-circular groove in the garniture base. Optimum horizontal conditions will be maintained unaltered after the setting-up of the machine and the same dimensions can be easily repeated. For circular rod production, the horizontal location of the long and short folders is critical and need not be varied to accommodate changes in the conditions of the tobacco or the filter material. Accurate horizontal location of the tongue, while not critical, is nevertheless desirable.

For obtaining a good tobacco rod, provision for adjusting vertically the tongue and long folder, and possibly the short folder, are necessary. In the case of filter rod, only the long-folder adjustment is essential, but provision for adjustment of the tongue and, possibly, the short folder is desirable. As, in the case of a filter rod, it is less important accurately to align the tongue centrally and parallel to the groove. Rods of adequate quality could in some circumstances be obtained with a conventional tongue. If consistent high quality is required, however, provision for correct alignment and for vertical adjustment of the tongue is desirable.

Toggle clamps may be used to secure the long folder and/or tongue in position on the base in order to allow quick and easy removal and replacement. The number of screws required to hold the garniture members in position is then reduced, thus facilitating quick removal of any member. When the members are secured to the base, an integral unit is produced which can be quickly and easily transferred from one machine to another.

A preferred embodiment of the invention, suitable for the production of either a tobacco rod or filter rod, will now be more fully described by way of example and with reference to the accompanying drawings in which:

FIGURE 1 is a front perspective view of the tongue, short-folder and long-folder forming the garniture for a rod-producing machine.

FIGURE 2 a rear perspective view thereof.

FIGURE 3 a detail cross section to a larger scale through means for adjusting the tongue piece,

FIGURE 4 a perspective view of a wedge and other parts shown in FIGURE 3,

FIGURE 5 an exploded perspective view of parts at the short folder,

FIGURE 6 a vertical section, taken longitudinally of the long folder, showing one of two spring-loaded plungers supporting the said folder, and

FIGURE 7 a vertical section, also taken longitudinally of the long folder, through means for setting the position of the said folder.

Referring to FIGURES 1 and 2, the tongue, short-folder and long-folder sections of the garniture are indicated generally at 1, 2 and 3 respectively. They are mounted upon a common base plate 4 which is supported upon the frame of the machine in a conventional manner by means of a bracket 5, part of which is shown in chain lines in FIGURE 1. The usual carrier tape bearing the cigarette paper and tobacco, or filter material, enters the garniture in the direction of the arrow 6 in FIGURE 1 and the rod leaves the garniture at the opposite end in the direction of the arrow 7 in FIGURE 2. The manner in which the tape is carried through the garniture and the operations performed in the several sections thereof are well known and need not be further described in this specification.

The tongue (FIGURE 3) comprises two parts, namely a bracket 8 carrying the tongue-piece proper 9 and a separate block 10 to which the bracket is secured in a fixed relative position by screws 11. The block 10 is formed with a keyway 12 engaged by upstanding keys 13 fixed
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3 in a slot 14 in a wedge-shaped plate 15. The latter is fixed to a plate 16 which is in turn secured to the base 4. The keyway 12 is accurately aligned in relation to the tongue piece 9 on a jig. The parts 15, 16 are permanently located horizontally in relation to the base 4 by dowels and no adjustment screws are provided here. Consequently, once the keyway has been so aligned, the tongue piece 9 will always be held centrally over and parallel to the usual rod-guiding groove 17 in the base 4 and, moreover, the whole tongue assembly can be transferred to any other machine of the same type without the need for further adjustment. To avoid risk of undesirable side-to-side movement of the tongue piece, the keys 13 are made relatively narrow, say ¾ inch wide, and to be a close fit in the keyway 12 in the block 10.

Necessarv vertical adjustment of the height of the tongue piece 9 in relation to the base 4 is effected by means of a transversely slideable wedge 18 engaging between the parts 10 and 15, the narrow edge of this wedge being slotted at 19 (FIGURE 4) so as to clear the keys 13. The wedge 18 is adjustable by means of eccentric nuts 20 on a shaft 21 mounted in a side block 22 secured to the base 4. A dependent portion 23 of the wedge 18 is held against the eccentrics 20 by a compression spring 24 acting on it by way of a pull rod 25. The shaft 21 can be turned by a knob 26 which may, if desired, be calibrated with a scale to allow standard settings of the vertical height of the tongue piece 9 to the case may be, is altered. The total range of adjustment may be approximately 40 thousandths of an inch. Once an adjustment has been set, the adjustment means can be locked by a clamp 27 acting on the shaft 21. The tongue assembly is held in position upon the base 4 by means of a simple clamp 28, which may be of a known toggle type.

The components of the short folder assembly are shown in FIGURE 5. Once the conventional short folder 29 has been set in position, no movement thereof is necessary. Consequently no means for its adjustment is provided. However, as its height requires to be slightly less at the exit end than at the entry end, it is placed upon a wedge 30 of fixed slope (shown exaggerated in FIGURE 5). Three such wedges having the same slope, but of different thicknesses, can be provided for varying the height of the short folder 29 to deal with different types of tobacco or filter material. The majority of manufacturing requirement can be met with a single wedge, which would be the thickest of the three. The parts 29 and 30 are located on the base 4 by means of dowels 31 and are held to the base by a countersunk screw 32 at about the mid-length. Easy removal is facilitated by this simple arrangement.

The conventional long folder 33 is located, in the horizontal plane, in relation to the base 4 in the known manner by means of a dowel 34 (FIGURE 7) which is fixed in the base, passes with clearance through a large hole 34' in the long folder and is a close fit in a hole in a small removable setting plate 35. The plate 35 is fixed to the long folder beside its entry end by two screws 36 which pass with clearance through holes 37 in the plate. With the screws 36 slackened off, the entry end of the long folder 33 can be adjusted, in relation to the dowel 34, to an aligned position above the base 4. After such adjustment, movement of the carrier tape will hold the exit end of the long folder 33 in position with some tendency to force that end out of line in the rearward direction in FIGURE 2. An adjustable screw 38 (FIGURE 1) mounted in a bracket 50 on the base 4 is arranged to serve as an abutment to resist this tendency. Also, by adjustment of the screw 38, the long folder 33 can be moved from substantial parallelism with the groove 17 in the base 4 to a displaced position ensuring optimum roundness of the finished rod.

The long folder 33 could be provided with a second plate 37, co-operating with a dowel 34 in the manner illustrated, also beside the exist end of the said folder. Such provision at the exit end is, however, not necessary and the simple arrangement described is preferred, because a larger displacement in relation to a mean position is possible and the arrangement of the carrier tape in its correct position reading folder is facilitated.

The long folder 33 is supported from the bracket 5, clear of the base 4, by means of two collared plungers 39 (FIGURE 6) located at the positions indicated by centre lines in FIGURE 2. The plungers 39 are loaded upwardly by compression springs 40 which sit in wells 41 in the bracket 5. With this arrangement, there is no risk of the springs being lost when the long folder 33 is removed.

Vertical height adjustment of the long folder 33, against the resistance of the springs 40, is effected with the assistance of fine eccentrics 42 on a shaft 43 supported in parts 44 of a mounting structure. The eccentrics 42 act upon the upper ends of brackets 45 guided in the said structure and are connected to the long folder 33 by locking or bearing screws 46. The shaft 43 is provided with a knob 47 having a clearly readable calibrated scale, with a range of say 32 thousandths of an inch, indicating the height of the long folder. With this arrangement, the said height can be readily preset or reset while the machine is in operation. The setting can be locked by a clamping screw 48. The whole long-folder assembly is held in position on the base 4, by way of the aforesaid mounting structure, by means of a clamp 49, which may be of known double, over-centre, toggle type. Quick and easy removal of the assembly is thus possible.

It is not essential that the long folder should be attached to and removable with its clamp. At least in the case of filter-rod manufacturer, however, this arrangement is preferred, as friction heats the long folder and its removal from the vicinity of the filter material is desirable if the machine is stopped by any reason.

With the garniture described above, each assembly is readily removable independently or the whole garniture can be moved bodily on the base 4 from one machine to another without difficulty in setting up. For all dimensions for which variation is undesirable, the settings are correctly fixed, prior to use, in a quick and accurate manner. Those dimensions which do require adjustment during the working of the machine can be readily adjusted, without dismantling the assembly or garniture. Setting for circumferential accuracy and dimension simple and required dimensions can be accurately reproduced.

Different machines can easily be adjusted to give accurate control, so that variations in size and filling as between different machines can be minimised. The garniture as a whole reliably produces a good round rod, and although the garniture is adaptable, it requires little attention and setting by the operator.

Provision may be made for remote control, particularly of the height adjustment of the long folder. Such remote control may be manual or may be automatic in response to signals from one or more devices monitoring the production of the rod.

We claim:

1. A garniture for use in a machine for producing a rod of cigarette tobacco or of smoke-filtering material, wherein the tongue, short folder and long folder are mounted upon a common base in relation to which their horizontal positions in the longitudinal and transverse directions are preset accurately, but the position in the vertical direction of at least the long folder is made readily adjustable.

2. A garniture according to claim 1, wherein the position in the vertical direction of the tongue is also made readily adjustable.
3. A garniture according to claim 1, wherein means for the vertical adjustment of the long folder and of the tongue comprises eccentric means.

4. A garniture according to claim 1, wherein means for the vertical adjustment of the long folder and the tongue includes a calibrated scale by reference to which the adjustment can be effected.

5. A garniture according to claim 1, wherein means for the vertical adjustment of the long folder and the tongue comprises adjustable wedge means acting between a part connected to the base and a part supporting the tongue piece proper.

6. A garniture according to claim 1, wherein the tongue piece proper is located horizontally in relation to the base by means of a tightly fitting key and keyway.

7. A garniture according to claim 1, wherein the tongue piece proper is located horizontally in relation to the base by means of a tightly fitting key and keyway and an adjustable wedge is disposed between a part connected to the base, in which part the key is fixed, and a part supporting the tongue piece, in which the keyway is formed.

8. A garniture according to claim 1, wherein means for the vertical adjustment of the long folder and of the tongue comprises eccentric means and an adjustable wedge engaged by the said eccentric means and loaded by a spring.

9. A garniture according to claim 1, wherein the short folder is supported from the base by a wedge of fixed slope, the horizontal position of the said folder and wedge in relation to the base being fixed by means of dowels.

10. A garniture according to claim 1, wherein the long folder is supported, in such a manner as to allow of its vertical adjustment in relation to the base, by means of spring-loaded plungers which engage in the base and upon which the long folder rests with clearance above the base.

11. A garniture according to claim 1, wherein the long folder is located in relation to the base, in such a manner as to allow of setting of its horizontal position in relation to the base, by at least one setting plate and a dowel fixed in the base and passing with clearance through the long folder, the said plate engaging the dowel by a hole without clearance and being secured to the long folder by screws which pass through holes in the plate with sufficient clearance to permit of the setting of the horizontal position of the long folder.

12. A garniture according to claim 1, wherein the tongue, short folder and long folder are removable from the base as separate units.

13. A garniture according to claim 1, wherein the tongue and long folder are secured to the base, in such a manner as to be removable bodily, by readily releasable clamping means.

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