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HANDLOOM

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Fig. 1.

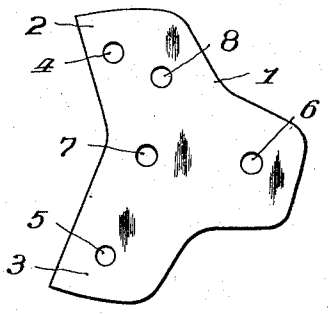

Fig. 2.

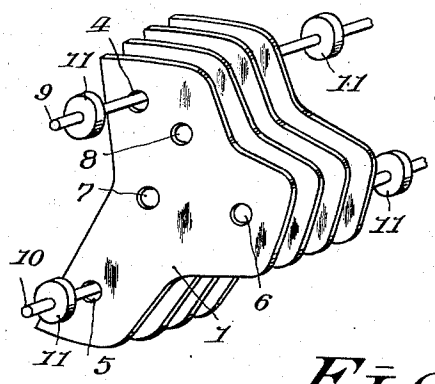

Fig. 2a.

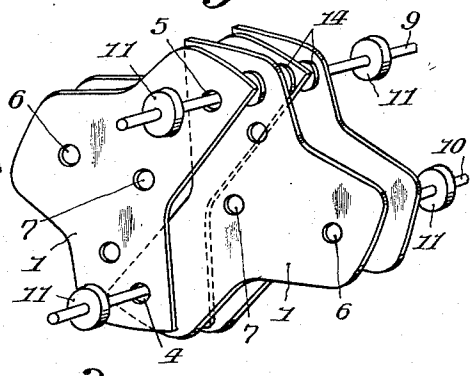

Fig. 3.

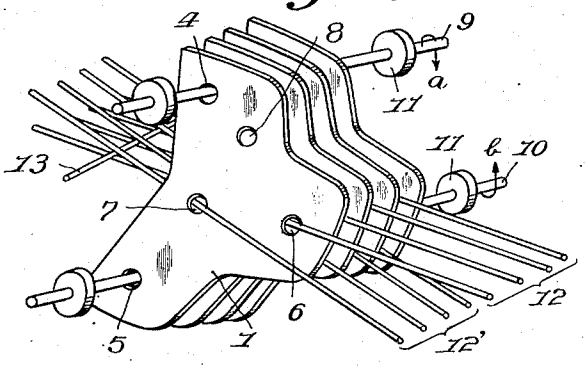

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Fig. 4.

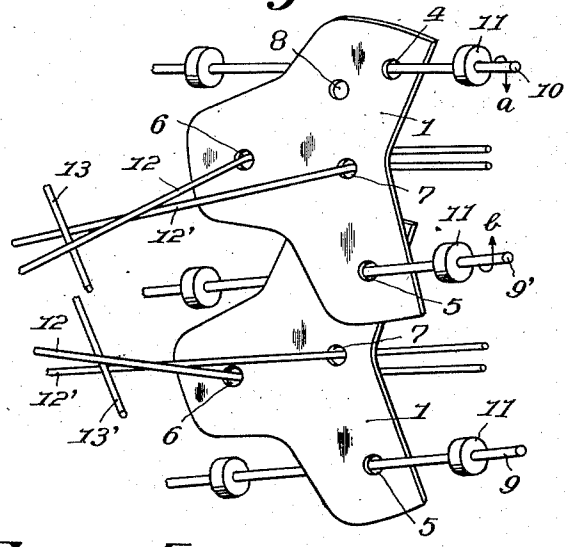

Fig. 5.

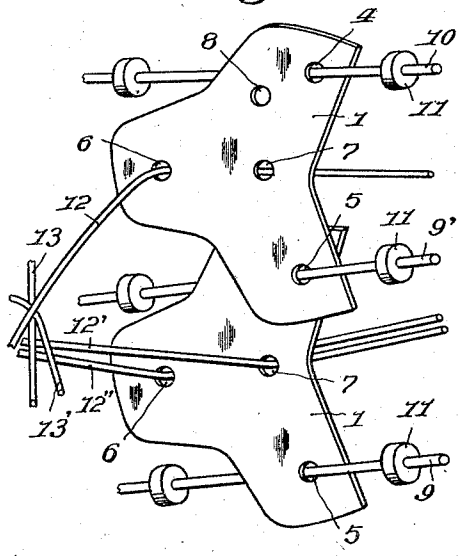

Fig. 6.

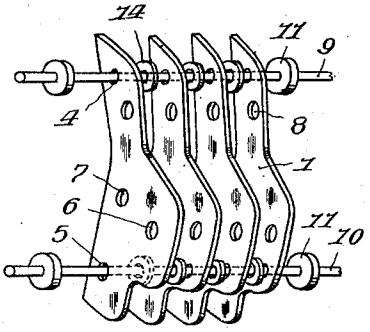

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Fig. 7.

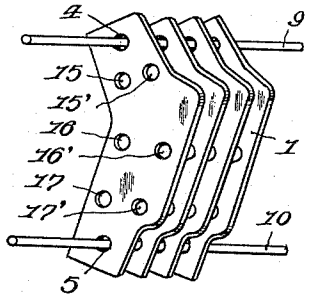


Fig. 8.

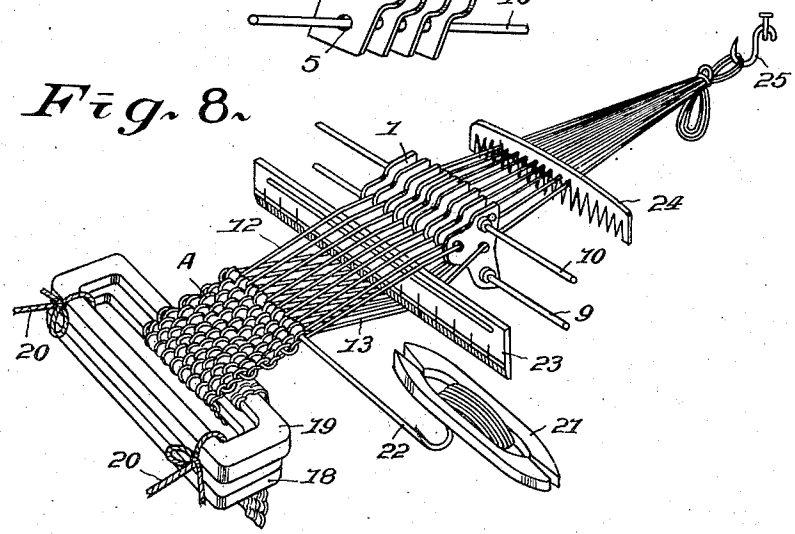
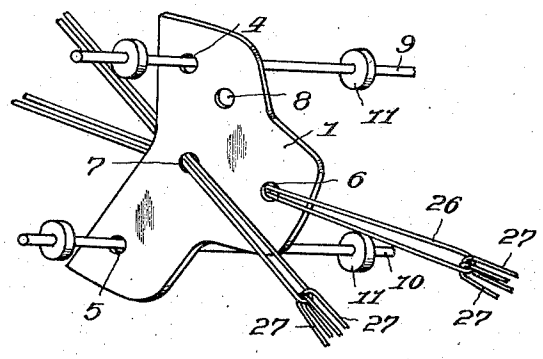


Fig. 9.



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HANDLOOM

Toshiko Sakano, Ota-ku, Tokyo-to, Japan

Application March 31, 1953, Serial No. 355,717

5 Claims. (Cl. 139—29)

The present invention relates to a novel handloom capable of weaving various cloths such as the one to be used, for example, as necktie, muffler, belt, purse, sash and the like.

The object of this invention is to provide a simple and cheap handloom capable of weaving simply and cheaply a cloth suitable for necktie, muffler, belt, purse, sash or any other kind of cloth.

According to this invention, the handloom consists of many operating plates provided with holes for letting warps pass through and operating rods which pass through the holes made on the said plates and support the said plates so that the latter may be oscillated by moving at least one of the said rods.

The said operating plates may be made of any material such as fiber, wood, pasteboard, metal or transparent or non-transparent Celluloid or synthetic resin and also they may be coloured or painted with any paint or varnish.

The said object, construction and weaving manner of the handloom of this invention will be clearly understood by reference to the following detailed description in connection with the accompanying drawings, wherein preferred several examples of this invention are illustrated.

Fig. 1 is a front view of an example of the operating plate to be used in the handloom of this invention.

Fig. 2 is a perspective view of a fundamental example of this invention, wherein the operating plates illustrated in Fig. 1 are used.

Fig. 2*a* is a perspective view of the handloom illustrated in Fig. 2, wherein the operating plates are arranged in another operating manner.

Fig. 3 is a perspective view of the handloom illustrated in Fig. 2 under normal weaving condition.

Fig. 4 shows an arrangement of the operating plates of the handloom illustrated in Fig. 2, whereby double cloth may be woven.

Fig. 5 shows an arrangement of the operating plates of the handloom illustrated in Fig. 2, whereby two-faced cloth may be woven.

Fig. 6 is a perspective view of another example of this invention.

Fig. 7 is a perspective view of further example of this invention.

Fig. 8 is a perspective view for showing the actual weaving manner, wherein the handloom illustrated in Fig. 2 is used.

Fig. 9 is a perspective view for describing another weaving manner, wherein the handloom illustrated in Fig. 2 is used.

In Figs. 1 and 2, the operating plate **1** is made of any material such as, for example, fiber, Celluloid, pasteboard, synthetic resin, wood or metal so that it may take a clover shaped form provided with projected leg-parts **2** and 3. The said plate is provided with small holes 4 and 5 at the said parts **2** and **3**, other holes **6** and **7** at the center parts, and sub-hole **8** at the part near the hole **4**.

A group of the said plates **1** are supported by operating

rods **9** and **10** passing through the holes **4** and **5** so that they may construct a handloom as shown in Fig. 2.

After the said combination of the operating plates **1** and rods **9** and **10**, the claspers **11** preferably made of an elastic material such as gum, synthetic resin or the like are fitted frictionally on the said rods, the said claspers being used to maintain the operating plates within a predetermined position.

When a single cloth is to be woven by the handloom illustrated in Fig. 2, the warps **12**, **12'** are passed, as shown clearly in Fig. 3, through the holes **6**, **7**, the said warps are crossed by moving the rods **9** and **10** alternately towards arrow directions *a* and *b* and reverse directions over an angle and a woof **13** is passed crosswise through every crossed part of the warps **12** and **12'**.

In such a manner, single cloth will be woven.

An actual weaving mechanism including the main handloom illustrated in Fig. 2 and other accessory device is shown in Fig. 8, wherein the woven cloth A is held between two holding frames **18** and **19** of rectangular form, the said frames being held by strings **20** on one's body and being used to adjust the stretchiness of the warps by moving one's body frontwards or backwards in accordance with the kind of warps, formation of the woven cloth and etc., a shuttle **21** wound with woof **22** is used to pass crosswise the said woof through the crossed part of the warps **12** and **13**, a scale **23** is used for determining the width of the woven cloth, keeping sufficient gap for passing the said shuttle **21** and tightening the newly woven part, the said scale being taken off at every oscillation of the operating plates **1**, a comb **24** is used to protect tangle of the warps, and a hook **25** is used to hook the warps for the purpose of stretching the warps. As an other accessory device of the apparatus illustrated in Fig. 8, a rectangular plate of predetermined length may be used also to determine simply the total length of warp to be woven by wound numbers of the warp, the said plate being not shown in the drawing.

When a double cloth is woven, the operating plates **1** are arranged above and below at every other plate as shown in Fig. 4 so that the hole **5** of the upper plate **1** faces directly to the hole **4** of the lower plate **1**, through the said facing holes **4** and **5** being passed an auxiliary operating rod **9'** and through the other upper and lower holes **5** and **4** of the upper and lower plates **1** being passed respectively the operating rods **10** and **9**. After arrangement of the handloom as above, firstly warps **12** and **12'** passing through the holes **6** and **7** of the upper plates **1** are crossed with each other by moving the rods **10** and **9'** alernately towards arrow direction *a* and *b* reverse directions, warps **12** and **12'** passing through the holes **6** and **7** of the lower plates **1** are crossed with each other by moving the rods **9'** and **10** as above and woofs **13** and **13'** are passed crosswise through every crossed part of the warps **12**, **12'** and **12**, **12'**. Then, doubly woven cloth will be obtained. If the group consisting of upper warps **12** and **12'** and the group of warps consisting of lower warps **12** and **12'** are crossed with each other by oscillating the upper and lower operating plates by means of movement of the rods **10** and **9** as above and four woofs are passed crosswise through the every crossed part, then thick part of the cloth will be woven resulting in obtainment of complex pattern. Such weaving manner may be combined with the double weaving manner as set forth at some part of the woven cloth.

Furthermore, if after the upper and lower cloth are woven in some length the upper group and the lower group of warps **12** and **12'** are crossed with each other by crossing the upper and lower operating plates and then crossing of a woof is carried out in each of the upper and lower layers, then the upper and lower surfaces of the

woven cloth will be turned at the crossed position of the said groups.

The arrangement of the operating plates as shown in Fig. 4 may be used to weave three warps **12**, **12'** and **12''**, such weaving manner being shown in Fig. 5, wherein if one warp **12** passing through the holes of the upper operating plates **1** and two warps **12'** and **12''** passing through the holes **6** and **7** of the lower operating plates **1** are crossed by oscillating the upper and lower plates by means of movement of the operating rods **10** and **9** and a woof or several woofs **13** and **13'** are passed through the every crossed part, then any complex cloth can be woven.

According to the construction illustrated in Fig. 2, it is possible to weave simply and cheaply any complex cloth as well as simple cloth by only simple operation as described in connection with the Figs. 3, 4 and 5, because the construction and the operating manner of the handloom are very simple. When the hole **8** of the plate **1** is used instead of the hole **4**, oscillating angle of the plate will be varied. The said hole **8** may be used, if necessary, for passing a warp.

In the Fig. 6 is shown another example of this invention, wherein washers **14** are supported loosely by the operating rods **9** and **10** at the gap between two adjacent plates **1**, the said washer being made of any material such as press fiber, pasteboard, Celluloid or synthetic resin and being used to maintain each of the operating plates in separated positions. The number of the washers **14** arranged per gap between two adjacent plates may be selected as two or more in accordance with the thickness of the thread to be used.

According to the handloom illustrated in Fig. 6, the operation under crossed condition of warps will be carried out smoothly owing to the washer **14**.

According to this invention, the operating plate **1** may be formed as shown in Fig. 7, wherein the plate **1** is provided with three pairs of holes **15** and **15'**, **16** and **16'**, **17** and **17'** to pass warps besides the holes **4** and **5** for letting the operating rods pass through. When only the holes **16** and **16'** are used as described as the holes **6** and **7** of the plate **1** illustrated in Fig. 3, then the single cloth will be woven as described in connection with the Fig. 3.

When warps are passed through the holes **15**, **15'** and **17**, **17'** and a woof is passed crosswise through each of the crossed parts of the warps **15**, **15'** and **17**, **17'**, the said crossed parts being made by moving the rods **4** and **5** as described in connection with the Fig. 4, then the doubly woven cloth may be obtained.

Furthermore, according to the handloom of this invention, it is easily possible to weave a cloth having thin and narrow part and thick and wide part by using warps consisting of a doubled warp **26** and two or more of doubled warp **27**, as shown in Fig. 9, the latter being hooked on the bent part **28** of the former. The number of the said warps **26** and **27** may be elected at will in accordance with the kind of the cloth to be woven.

By such method, a cloth suitable for a necktie, of which neck part should be thin and narrow and front part should be thick and wide, will be easily woven. And also if as the warps **26** and **27** are used the warps of different colour and material, then various kinds of cloth of different pattern may be woven.

Furthermore, as the warps and woofs to be used the thread such as, for example, normal binding string, other string made of woolen yarn, silk yarn, synthetic yarn, waste yarn, old cloth, cotton yarn or paper string may be used. And also any kind of vegetable thread may be used.

As it is evident that many changes and modifications can be made in the above described details of this invention without departing from the nature and spirit of this invention, it is to be understood that this invention is not to be limited to those details as set forth.

Having thus described my invention I claim:

1. Handloom capable of weaving various kinds of cloth such as the one to be used, for example, as necktie, purse, muffler, belt, band, sash or other kind of cloth, which comprises a plurality of operating plates provided with a series of first holes for letting warps pass through and a series of second holes, and a plurality of operating rods passing through the second holes in said plates, said rods supporting said plates in non-rigid relationship so that the latter may be oscillated by moving at least one of the said rods to cross the said warps.

2. Handloom capable of weaving various kinds of cloth as claimed in claim 1, wherein the operating plates are clover-leaf shaped.

3. Handloom as claimed in claim 1, wherein the operating rods are provided with grippers at the outside of the operating plates, the said grippers being fitted frictionally on the operating rod and being made of an elastic rubber-like material.

4. Handloom as claimed in claim 1, wherein at least one washer is supported freely on the operating rod in the gap between two adjacent operating plates, the said washer being used for carrying out the operation smoothly.

5. In the handloom as claimed in claim 1, a holder which is used for holding the woven cloth to stretch the said cloth and warps, said holder being made of two frames of rectangular form.

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