Oct. 31, 1939. F. H. KAUFMANN 2,178,452

EXPANSION COMB FOR TEXTILE MACHINES

Filed Sept. 16, 1938

Fig. 1.

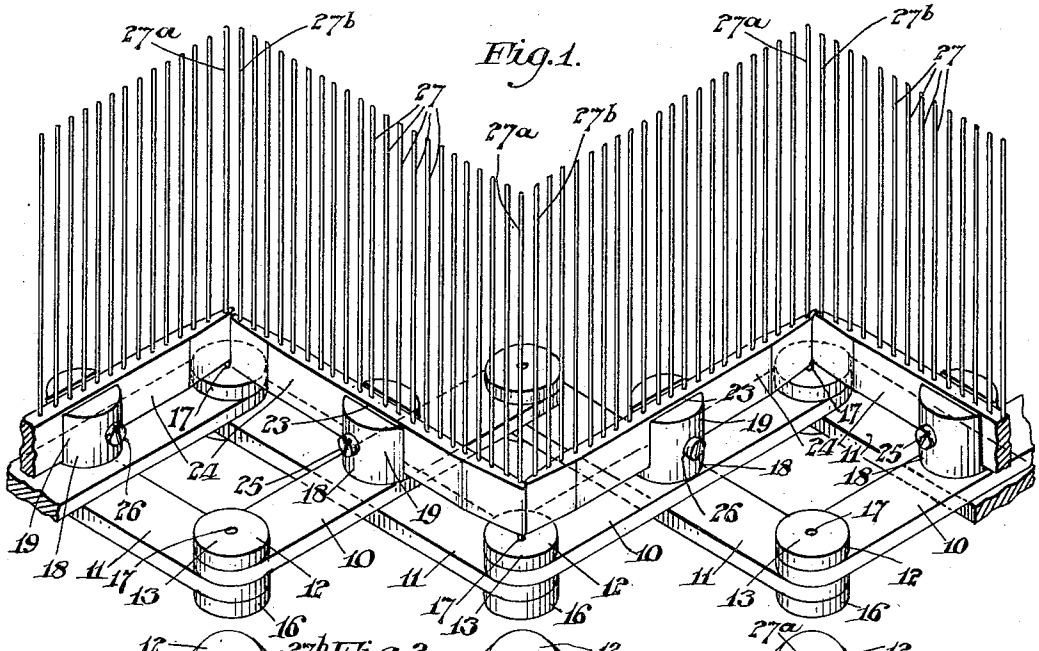


Fig. 2.

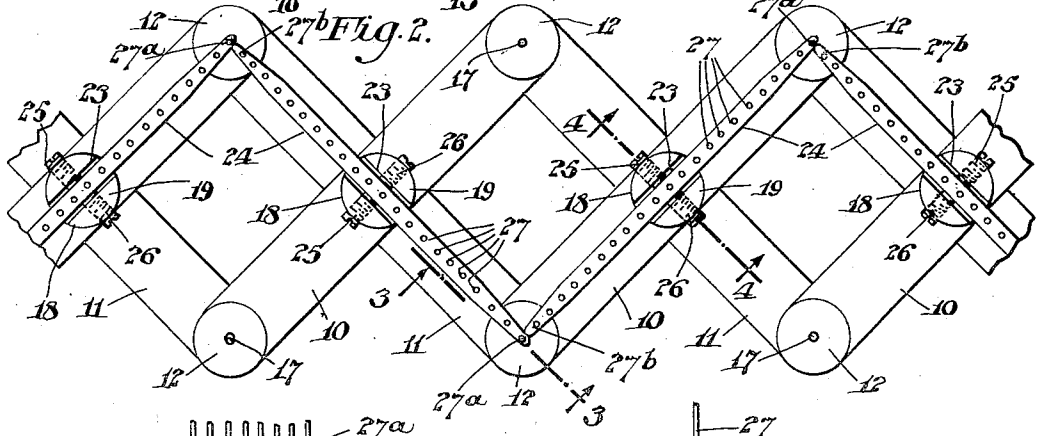


Fig. 3.

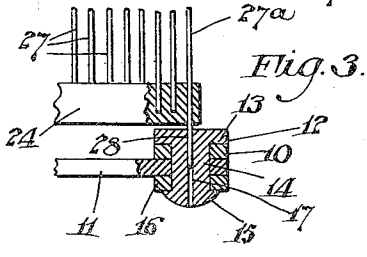
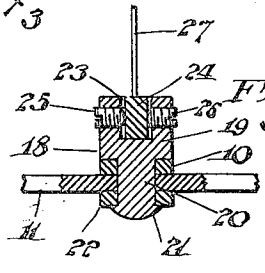


Fig. 4.



Inventor:
Frank H. Kaufmann,
By Jas. C. Nobesmith
Attorney.

Patented Oct. 31, 1939

2,178,452

UNITED STATES PATENT OFFICE

2,178,452

EXPANSION COMB FOR TEXTILE MACHINES

Frank H. Kaufmann, Elkins Park, Pa., assignor to Steel Heddle Manufacturing Company, Philadelphia, Pa., a corporation of Pennsylvania

Application September 16, 1938, Serial No. 230,187

14 Claims. (Cl. 28—54)

This invention relates to expansion combs for textile machines, and it relates more particularly to that type of expansion comb in which there is provided a series of individual section combs, disposed in an angular arrangement, and supported on a series of links pivotally connected to each other in a lazy-tongs formation whereby, when the lazy-tongs are contracted or expanded, the angularity of the individual combs is changed to modify the distance between the individual threads in a warp which is guided by the comb. As is well known to those familiar with the art, such combs are used for the purpose of guiding the threads of the warp to their proper places on the beam on which they are wound, and they are also used in other textile machines for similar purposes.

Heretofore in the use of expansion combs of the lazy-tongs type, it was exceedingly difficult, when the spacing of the threads was to be changed, to adjust the section combs in the supports carried by the links, particularly where said section combs were disposed in a zigzag arrangement, to obtain the proper spacing between the terminal dents carried by the adjacent ends of the combs. Furthermore, the supports carried by the links for supporting the individual combs limited the extent to which the lazy-tongs could otherwise be extended or retracted.

The principal object of the present invention is to provide an expansion comb of the type in which the individual combs are supported on a lazy-tong link work, which is so constructed and arranged that the proper spacing between the terminal dents of the individual combs may be readily and quickly obtained with a minimum of manipulation on the part of the operator.

A further object of the invention is to provide an expansion comb, of the type hereinbefore referred to, which is so constructed and arranged that a greater extent of expansion and contraction is obtainable.

A further object of the invention is to provide an expansion comb which is so constructed and arranged that section combs may be disposed therein, as preferred, either in zigzag arrangement or in a spaced angular relationship parallel to each other.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawing forming part hereof, in which:

Figure 1 is a perspective view of a portion of an expansion comb for textile machines embodying the main features of the present invention;

Fig. 2 is a fragmentary plan view thereof;

Fig. 3 is a fragmentary section, taken approximately on the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary section, taken approximately on the line 4—4 of Fig. 2.

It should of course be understood that the drawing and description herein contained are illustrative merely, and that various changes and modifications may be made in the structure disclosed without departing from the spirit of the invention.

Referring to the drawing, as there shown the supports for the individual section combs consist of a plurality of links 10 and 11, pivoted to each other in lazy-tongs formation, in a manner similar to that of expansion combs of this general type, which are well known and in common use. In such an arrangement, one parallel series of links 10 is disposed in an upper plane, and the other parallel series of links 11 is disposed in a lower plane. The rivets 12, which serve as the pivots for the ends of the respective links each have an enlarged head portion 13 disposed on the upper face of a link, a shank portion 14 which forms the pivot proper, and a turned over terminal portion 15 at the lower end of the shank. A washer 16 is interposed between the turned over portion of the shank and the under face of a link 11.

Each rivet 12, along the front and rear of the link work, is provided with a hole 17 extending vertically downward through the head 13 and shank 14 of said rivet, for a purpose to be presently explained.

At the places where the links 10 and 11 cross each other, intermediate their ends, there are provided pivot members 18, each having an enlarged and upwardly extending head portion 19, and a downwardly extending shank portion 20 which forms the pivot proper at this point, the lower end of the shank being turned over as at 21 in a manner similar to that of the rivets 12, below a washer 22. Each of the upwardly extending head portions 19 is provided with a groove or slot 23 in which the bar portion 24 of a comb section is adapted to be seated. Each of the grooves or slots 23 is of a width slightly in excess of the thickness of the bar portion 24 of the section comb which is mounted therein, for a purpose to be presently explained.

Each of the upwardly extending head portions 19 of the pivot members 18 is provided with oppositely disposed set-screws 25 and 26, ar-

ranged transversely to the slot in said head portion.

The individual section combs are substantially similar to the combs at present used in apparatus of this general character, that is to say, each of said combs comprises a bar portion 24 of suitable length, in which is disposed a series of equally spaced upwardly extending dents 27 preferably made of round hardened steel wire. The ends of each bar 24 are suitably shaped to minimize, as much as possible, interference with the adjacent ends of the other bars of the series of combs.

However, the terminal dent 27a at one end of each of the section combs extends entirely through the bar portion 24 and projects downwardly a sufficient distance as at 28 whereby the same may be positioned in the hole 17 in one of the rivets 12, which will cause said terminal dent 27a to be positioned at all times in alinement with the axis of the pivot member 12 in which its projecting end portion is located. Of course, other pivot means for the combs may be used if preferred.

In setting up the apparatus for use in guiding the warp threads in their proper spacing, the link work is first extended or retracted to the proper extent. The set-screws 25 and 26, in the head portions of the pivot members 18, are of course retracted by reason of having been loosened to remove the section combs previously positioned therein. The section combs, with properly pitched dents, are then mounted successively in place, the downwardly extending portion 28 of the terminal dent 27a of each section comb being positioned in the hole 17 in its respective pivot member 12. The operator now tightens the set-screws 25 and 26 in the pivot members 18, adjusting the same backwards and forwards until the dent 27b at the end of the bar 24 remote from the end in which the pivot extension 28 is provided, is brought to the proper spaced relationship with respect to the terminal dent 27a of the next adjacent comb.

It will be found in practice that the setting up of an expansion comb, constructed and arranged as hereinbefore set forth, may be quickly and expeditiously done and the proper dent spacing may be obtained between the ends of the section combs, so that the warp will be fed evenly and uniformly to the beam or other apparatus in connection with which the device is used.

It will also be noted that by reason of the individual combs being held in the grooves, which are provided in the pivot members 18, used to connect the links 10 and 11 intermediate their ends, and the only limitation imposed on the extension or contraction of the device will be that due to the width of the links 10 and 11, there being no parts projecting upwardly from the links 11 in the lower plane as commonly provided in expansion combs of the type at present in common use, hence a greater degree of adjustment is obtainable with the device of the present invention and a wider range of warp spacing is obtainable with a given set of section combs.

It should be understood that, if desired, the section combs may be mounted in the heads of the pivot members 18 in spaced angular relationship, parallel to each other, which arrangement is sometimes used in devices of this character, instead of being disposed in the zigzag arrangement shown in the drawing, the device being adaptable to receive the combs in either of the alternative arrangements.

I claim:

1. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, expansible and contractible means for supporting said section combs in an angular arrangement, means for pivotally connecting each of the section combs to the supporting structure, and means for adjusting said section combs about their pivotal connections.

2. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, expansible and contractible means for supporting said section combs in zigzag formation, means for pivotally connecting one end of each of the section combs to the supporting structure, and means for adjusting said section combs about their pivotal connections thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

3. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, expansible and contractible means for supporting said section combs in zigzag formation, means for pivotally connecting one end of each of the section combs to the supporting structure, and means engaging said section combs intermediate their ends for adjusting the same about their pivotal connections thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

4. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, each of said section combs having a downwardly projecting pin at one end thereof, and expansible and contractible means for supporting said section combs in zigzag formation including members provided with holes for the reception of the pins carried by the section combs, and means for adjustably supporting the bar portions of the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

5. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, each of said section combs having a downwardly projecting pin at one end thereof, and expansible and contractible means for supporting said section combs in zigzag formation including members provided with holes for the reception of the pins carried by the section combs, and members having head portions provided with recesses adapted to receive the bar portions of the section combs, said recesses being of a width in excess of the thickness of the bar portions of the section combs, and means in said head portions adapted to adjust the section combs about the pins carried by the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

6. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, the dent at one end of each of said section combs extending through the bar member and projecting downwardly to provide a pin at one end of said comb, and expansible and contractible means for sup-

porting said section combs in zigzag formation including members provided with holes for the reception of the pins carried by the section combs, and members having head portions provided with recesses adapted to receive the bar portions of the section combs, said recesses being of a width in excess of the thickness of the bar portions of the section combs, and means in said head portions adapted to adjust the section combs about the pins carried by the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

7. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, the dent at one end of each of said section combs extending through the bar member and projecting downwardly to provide a pin at one end of said comb, and expansible and contractible means for supporting said section combs in zigzag formation including members provided with holes for the reception of the pins carried by the section combs, and members having head portions provided with recesses adapted to receive the bar portions of the section combs, said recesses being of a width in excess of the thickness of the bar portions of the section combs, and set screws oppositely disposed in said head portions adapted to adjust the section combs about the pins carried by the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

8. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, each of said section combs having a downwardly projecting pin at one end thereof, and means for supporting said section combs in zigzag formation comprising a plurality of links pivoted together in a lazy-tong arrangement, pivot members where the ends of said links are connected to each other, and pivot members where the links cross each other, certain of the pivot members where the ends of the links are connected to each other being provided with holes for the reception of the pins carried by the section combs, and means for adjustably supporting the bar portions of the section combs in the pivot members where the links cross each other thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

9. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, each of said section combs having a downwardly projecting pin at one end thereof, and means for supporting said section combs in zigzag formation comprising a plurality of links pivoted together in a lazy-tong arrangement, pivot members where the ends of said links are connected to each other, and pivot members where the links cross each other, certain of the pivot members where the ends of the links are connected to each other being provided with holes for the reception of the pins carried by the section combs, and the pivot members where the links cross each other being provided with recesses in the head portions thereof adapted to receive the bar portions of the section combs, said recesses being of a width in excess of the thickness of the bar portions of the section combs, and means in said head portions adapted to adjust the section combs about the pins carried by the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

10. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, the dent at one end of each of said section combs extending through the bar member and projecting downwardly to provide a pin at one end of said comb, and means for supporting said section combs in zigzag formation comprising a plurality of links pivoted together in a lazy-tong arrangement, pivot members where the ends of said links are connected to each other, and pivot members where the links cross each other, certain of the pivot members where the ends of the links are connected to each other being provided with holes for the reception of the pins carried by the section combs, and the pivot members where the links cross each other being provided with recesses in the head portions thereof adapted to receive the bar portions of the section combs, said recesses being of a width in excess of the thickness of the bar portions of the section combs, and means in said head portions adapted to adjust the section combs about the pins carried by the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

11. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, the dent at one end of each of said section combs extending through the bar member and projecting downwardly to provide a pin at one end of said comb, and means for supporting said section combs in zigzag formation comprising a plurality of links pivoted together in a lazy-tong arrangement, pivot members where the ends of said links are connected to each other, and pivot members where the links cross each other, certain of the pivot members where the ends of the links are connected to each other being provided with holes for the reception of the pins carried by the section combs, and the pivot members where the links cross each other being provided with recesses in the head portions thereof adapted to receive the bar portions of the section combs, said recesses being of a width in excess of the thickness of the bar portions of the section combs, and set screws oppositely disposed in said head portions adapted to adjust the section combs about the pins carried by the section combs thereby to adjust the end dent of one section comb with respect to the adjacent end dent of the adjoining section comb.

12. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, and means for supporting said section combs comprising a plurality of links pivoted together in a lazy-tong arrangement, with the links in each parallel series thereof disposed in upper and lower planes respectively, and members extending upwardly from the links in the upper plane and movable with respect thereto for holding the bar members of the section combs.

13. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents

extending upwardly therefrom, and means for supporting said section combs comprising a plurality of links pivoted together in a lazy-tong arrangement, pivot members where the ends of said links are connected to each other, and pivot members where said links cross each other having means for holding the bar members of the section combs.

14. In an expansion comb, a plurality of individual section combs each consisting of a bar member and a series of equally spaced dents extending upwardly therefrom, and means for supporting said section combs in zigzag formation comprising a plurality of links pivoted together in a lazy-tong arrangement, pivot members where the ends of said links are connected to each other, and pivot members where said links cross each other having means for holding the bar members of the section combs.

FRANK H. KAUFMANN.