Oct. 8, 1963 C. S. MORRELL 3,106,010

SPRING HINGE AND METHOD OF ASSEMBLING SAME

Filed Feb. 9, 1960

Fig. 1.

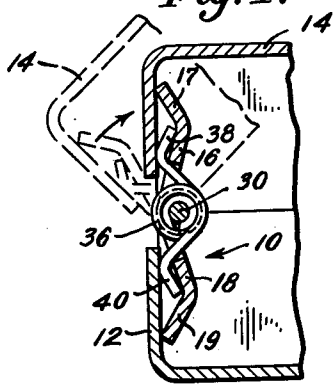


Fig. 4.

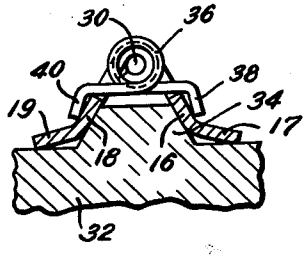


Fig. 2.

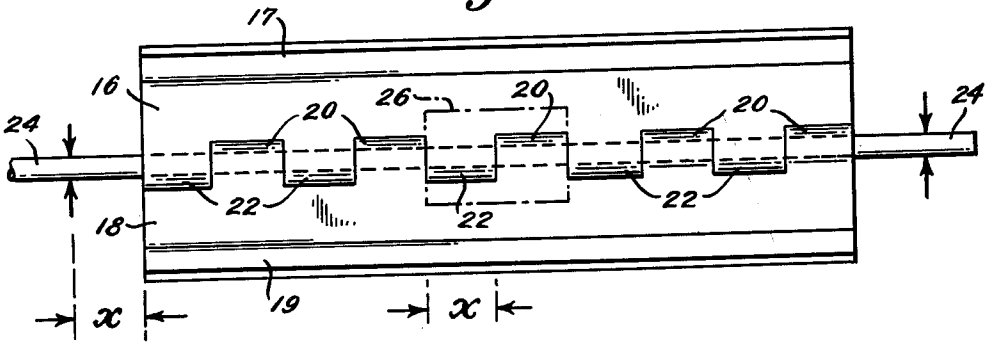


Fig. 3.

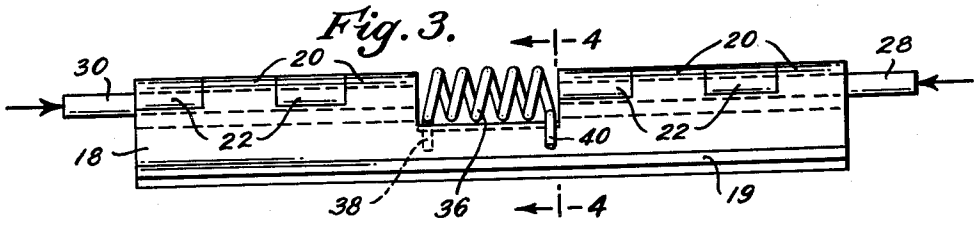
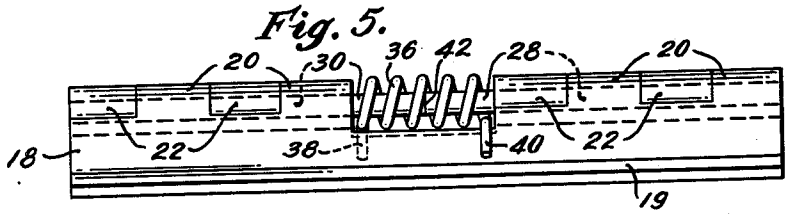


Fig. 5.



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SPRING HINGE AND METHOD OF ASSEMBLING SAME

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The present invention relates to a spring hinge and the method of assembling same. More particularly the present invention relates to a spring hinge construction wherein a coil spring adapted for use therein is assembled with the hinge leaves in a simplified operation.

Prior to the instant invention the usual method of assembling a spring hinge was to first position the hinge leaves in such a manner that the hinge rolls thereof were aligned for receiving a pintle therethrough. Before inserting the pintle through the aligned hinge rolls, the coil spring was positioned in a central opening, the axis of the coil spring being aligned with the axis of the hinge rolls. Care had to be necessarily taken to maintain the hinge rolls and coil spring in perfect alignment while the pintle was inserted therein and considerable time and effort were expended in threading the pintle through the hinge rolls and coil spring to complete the assembly operation.

The present invention avoids these heretofore known time consuming techniques in assemblying spring hinges and teaches a unique method in which the coil springs is assembled with the hinge leaves after the hinge leaves have been joined. Briefly the method embodied in the present invention includes the steps of first joining the hinge leaves by inserting an elongated pintle through the hinge rolls thereof. Since the coil spring is not assembled with the hinge leaves in the first step of the method, the pintle may be easily and quickly inserted through the hinge rolls. The elongated pintle in the first instance is not sized in accordance with the length of the hinge leaves and therefore the ends of the pintle are left exposed from the ends of the hinge leaves. With the hinge leaves joined together as indicated, the center portion thereof together with the section of the pintle extending therethrough is blanked out to form a centrally positioned rectangularly shaped slot. Since the center section of the pintle is also removed by the blanking out operation, the pintle is thus severed into two spaced sections. Simultaneously with the blanking out operation, the exposed ends of the pintle are severed to leave a predetermined portion thereof exposed, this predetermined portion corresponding to one-half the longitudinal dimension of the slot. The coil spring is then positioned in the slot, the coils of the coil spring being aligned with the hinge rolls and the pintles disposed therein. The opposed pintle sections are then pushed inwardly within the hinge leaves until the outer ends thereof are coextensive with the adjacent outer ends of the hinge leaves, and since the outer ends of the pintles are severed in a predetermined manner, the inner ends thereof are adapted to abut centrally of the slot. The abutting pintle sections thus define a continuous length that lock the coil spring within the slot in the hinge leaves.

Accordingly, it is an object of the present invention to teach an improved method of assembling a coil spring in a spring hinge construction.

Another object of the present invention is to provide a spring hinge assembly wherein the pintle joining the hinge leaves is split into sections, the inner edges of the pintle sections abutting to lock a coil spring in the assembled leaves.

Another object of the present invention is to teach a method of assembling a spring hinge wherein the pintle

joining the hinge leaves is split during the assembly operation.

Another object is to teach a method of assembling a spring hinge wherein a coil spring is inserted in the assembly after the hinge leaves are joined together.

Still another object is to teach a method of assembling a spring hinge wherein a pintle joining the hinge leaves is simultaneously blanked out at the midpoint thereof and severed at the outer end thereof to leave a predetermined portion exposed, the resulting pintle sections being pushed inwardly of said leaves a distance equal to the exposed portions and abutting at the mid-point of the blanked out section, thereby locking a coil spring in the assembly.

Other objects, features and advantages of the invention will become apparent as the description thereof proceeds when considered in connection with the accompanying illustrative drawing.

In the drawings which illustrate the best mode presently contemplated by me for carrying out my invention:

FIG. 1 is a fragmentary sectional view of a box construction illustrating the manner in which the spring hinge embodied herein is mounted for use, the pivoted position of the cover of the box being shown in dotted lines;

FIG. 2 is a plan view of the hinge leaves in their assembled position after the elongated pintle has been inserted through the hinge rolls thereof, the portion to be blanked out from the hinge leaves and pintle being shown in dotted lines, and the portion of the exposed pintle to be severed being shown by the pairs of opposed arrows;

FIG. 3 is a side elevational view of the joined hinge leaves in the assembly position thereof illustrating the coil spring as it is disposed in the blanked-out portion of the hinge leaves and prior to movement of the pintle sections therein, the direction of movement of the pintle sections being indicated by the arrows;

FIG. 4 is a vertical sectional view taken along lines 4—4 in FIG. 3; and

FIG. 5 is a view similar to FIG. 3, showing the finished hinge assembly.

Referring now to the drawing and particularly FIG. 1, the spring hinge embodied herein is illustrated in the manner of use thereof. As shown in FIG. 1, the spring hinge which is generally indicated at **10** is adapted to be utilized in a box construction, one leaf of the spring hinge being connected to the bottom **12** of the box and the other leaf of the spring hinge being secured to the cover member **14** of the box. In practice the spring hinge **10** is adapted to be utilized in relatively small box constructions and preferably is employed in jewelry boxes wherein a positive closing action of the cover member is required. As illustrated in FIG. 1, the cover member **14** is adapted to move to an open position as shown in dotted lines, the spring hinge **10** acting to return the cover member **10** to the closed position as indicated by the arrow.

Heretofore, spring hinges for joining cover members to boxes such as small jewelry boxes and the like have been assembled in a laborious manner by first aligning the leaves of the hinge prior to cutting a slot in each of the leaves of the hinge. The slots in the hinge leaves were similarly formed so that they would cooperate to define a rectangularly shaped slot for receiving a coil spring therein. Once the hinge leaves were aligned, the coil spring was then positioned in the slot.

The hinge leaves and coil spring were then assembled by inserting an elongated pintle therethrough. However, care had to be taken to maintain the hinge leaves and coil spring in alignment while the pintle was pushed through hinge rolls of the leaves and the opening in the coil spring. If a small spring hinge were employed, it is seen that alignment of the hinge rolls and coil spring could be a very exacting and time consuming task. Moreover, since the slot for receiving the coil spring was pre-

formed in the individual hinge leaves, in a separate operation, problems frequently occurred in aligning the coil spring with the hinge rolls. The present invention teaches a method of assembling a spring hinge that avoids the heretofore known problems and enables the complete hinge assembly to be effected in a simple operation.

Referring now to FIGS. 2, 3 and 5, the method of assembling the spring hinge 10 is illustrated and it is understood that the hinge leaves indicated at 16 and 18 are preformed to define edges 17 and 19 respectively and a plurality of hinge rolls. The hinge rolls formed on the leaf 16 are indicated at 22 and are spaced in the conventional manner, while hinge rolls 20 formed on the leaf 18 are also spaced but in alternate relation with respect to the hinge rolls 22 so that the hinge leaves 16, 18 may be properly related by interfitting the hinge rolls 20, 22.

In carrying out the assembly of the spring hinge 10, the hinge rolls 20 and 22 are first located in alternate aligned relation and an elongated pintle indicated at 24 is then inserted therethrough to pivotally interconnect the hinge leaves. As shown in FIG. 2, the elongated pintle 24 extends completely through the hinge rolls 20 and 22 and projects substantially beyond the ends of the hinge leaves, thereby leaving an exposed portion on either end thereof. With the hinge leaves 16 and 18 joined in the manner illustrated in FIG. 2 and with the pintle 24 extending substantially beyond the ends of the joined leaves, a center portion of the joined leaves is then blanked or punched out by a suitable punch press or machine.

The blanking or punching operation is adapted to remove an area of the spring hinge leaves 16, 18 that is approximately at the centermost portion thereof, the blanked out portion of the hinge leaves being indicated in dotted lines in FIG. 2 and defining a slot 26 that is generally rectangular in configuration when viewing the hinge leaves in plan.

Since the pintle 24 had been initially inserted through the hinge rolls 20, 22, the blanking out operation also removed that portion of the pintle that was coextensive with the blanked out portion of the hinge leaves, thereby splitting the pintle into two spaced sections 28 and 30 (FIG. 3).

Simultaneously with the forming of the slot 26 in the hinge leaves 16 and 18, the ends of the pintle 24 are sheared by a suitable cutting tool as indicated by the pairs of opposed arrows in FIG. 2. The shearing operation of the pintle 24 is performed in such a manner as to leave a predetermined portion of the pintle sections 28, 30 exposed on each side of the hinge leaves, the predetermined portions being defined by the dimension x. For the reasons set forth hereinafter, the exposed portions x of the pintle sections correspond to one-half the longitudinal dimension of the slot 26.

During the punching and shearing operation illustrated in FIG. 2, the hinge leaves 16 and 18 are preferably mounted on a flat surface; however, in the assembly of the hinge leaves with a coil spring, a form indicated at 32 in FIG. 4 is provided. The form 32 includes an upstanding projection 34 that is adapted to receive the hinge leaves 16 and 18 thereon so that the hinge rolls 28, 30 are located in an elevated position. With the hinge leaves 16 and 18 mounted on the form 32 in the manner illustrated, a coil spring indicated at 36 is placed on the projection 34 and is positioned within the slot 26. End extensions 38 and 40 of the coil spring 36 are adapted to coact with the outer faces of the hinge leaves 16 and 18, respectively, while the longitudinal axis of the coil spring is aligned with the openings in the hinge rolls 20 and 22 and with the pintle sections 28 and 30 that extend through the openings. It is understood, that the inner ends of the pintle sections 28 and 30 border the slot 26 since the elongated pintle 24 and hinge leaves 16 and 18 had been blanked out in the same operation to form the spring receiving slot 26.

The assembly of the spring hinge 10 is completed by moving the pintle sections 28, 30 inwardly as indicated by the opposed arrows in FIG. 3 until the outer ends of the pintle sections are coextensive with the adjacent edges of the hinge leaves. During this movement, the inner ends of the pintle sections 28, 30 are moved through the aligned coils of the coil spring 36 and meet in abutting relation at the center of the slot 26 which is indicated at 42 in FIG. 5. The abutting pintle sections 28, 30 then define a continuous pin construction and act to lock the coil spring 36 in the assembly with the hinge leaves 16 and 18. The spring hinge assembly is thus completed, and the spring hinge 10 may be attached to the bottom 12 and cover member 14 of the box construction as illustrated in FIG. 1.

The spring hinge embodied herein is unique in that the pintle securing the hinge leaves together is formed in a split construction. This split construction is obtained by the unique method of assembling the hinge leaves 16, 18 with the hinge pin prior to the blanking out operation for forming the spring receiving slot 26. It is seen that by assembling the hinge leaves with the coil spring in the manner described, the awkward method of aligning the hinge rolls of the hinge leaves with the coil spring and then inserting an elongated pintle therethrough is avoided. By the method taught in the present invention, the elongated pintle is initially inserted through the hinge rolls of the hinge leaves, but since the coil spring is not as yet mounted in the assembly, the pintle may be inserted through the hinge leaves without difficulty. Since the outer ends of the pintle are sheared to leave a predetermined portion exposed, the inner ends of the pintle sections will abut at the center of the slot when the outer ends of the pintle sections are coextensive with the adjacent outer edge of the hinge leaves. Once the center portion of the hinge leaves is blanked out to form the slot 26 and the outer ends of the pintle section thus formed are sheared to the predetermined dimension, it is a simple matter to insert the spring 36 on the form 32 and then push the pintle sections 28 and 30 inwardly until they meet at the centermost portion of the slot 26. With the inner ends of the pintle sections 28 and 30 abutting, the spring 36 is locked in the assembly and the assembled spring hinge is then ready for mounting in a box construction.

While there is shown and described herein certain specific structure embodying the invention, it will be manifest to those skilled in the art that various modifications and rearrangements of the parts may be made without departing from the spirit and scope of the underlying inventive concept and that the same is not limited to the particular forms herein shown and described except insofar as indicated by the scope of the appended claims.

What is claimed is:

1. A method of assembling a spring hinge comprising the steps of joining the hinge leaves of said spring hinge by projecting an elongated pintle through alternately positioned hinge rolls that are formed on the hinge leaves, the ends of said pintle being exposed at both ends of the joined hinge leaves, removing a portion of the center of said hinge leaves and pintle extending therethrough to divide said pintle and to form a slot and simultaneously cutting off the exterior portions of said pintle, but leaving a portion thereon that corresponds to one-half the axial length of said slot, positioning a coil spring within said slot, the opening through said coil spring being aligned with the divided sections of said pintle, and moving the divided pintle sections inwardly until the outer ends thereof are coextensive with the adjacent exterior edges of said hinge leaves, the inner ends of said pintle sections being forced through said coil spring for one-half the longitudinal dimension of the slot in said leaves, whereby the inner ends of said pintle sections abut to define a continuous length for retaining said coil spring in assembled position with said hinge leaves.

2. A method of assembling a spring hinge, comprising the steps of joining the leaves of said spring hinge by extending an elongated pintle through alternately positioned hinge rolls joined to said leaves, the ends of said pintle being exposed at both ends of the joined leaves, removing a portion of the joined leaves approximately at the centermost point thereof to define a slot that is substantially rectangular in configuration, said pintle being severed by said last step into opposed sections each of which has one end that is coextensive with the edge of said slot, cutting off a portion of the exposed ends of said pintle sections, the remaining exposed portions of said pintle sections each corresponding to one-half the longitudinal dimension of said slot, positioning a coil spring in said slot, pushing the opposed pintle sections inwardly through said hinge rolls until the exposed ends thereof are aligned with the outer ends of their hinge leaves, the inner ends of said severed pintle sections being forced through said coil spring until they meet at the center point thereof, the abutting ends of said pintle sections cooperating to lock the coil spring in the assembled hinge leaves.

3. A method of assembling a spring hinge, comprising the steps of joining the leaves of said hinge by a pintle, the opposed ends of said pintle extending outwardly of the ends of said hinge leaves, blanking out a portion of said joined hinge leaves and the pintle extending therethrough substantially at the midpoint thereof to divide said pintle and to define a centrally formed slot in said hinge leaves, the severed sections of said pintle bordering said slot, and simultaneously cutting a portion of the exposed ends of said severed pintle sections but leaving exposed a portion thereof that corresponds to one-half the longitudinal dimension of said slot, positioning a coil spring within said slot in coaxial relation with respect to said pintle sections, and moving said divided pintle sections inwardly through said coil spring until the inner ends thereof engage and the outer ends thereof are coextensive with the edges of said joined hinge leaves that are adjacent to each other, said coil spring thereby being locked in assembled relation with said hinge leaves.

4. A method of assembling a spring hinge, comprising the steps of joining the leaves of said hinge by inserting an elongated pintle through alternately positioned hinge rolls thereof and leaving a portion of said pintle exposed on both ends of the assembled leaves, blanking out a portion of the assembled leaves and pintle extending therein approximately at the center thereof to divide said pintle and to form a rectangularly shaped slot, and simultaneously cutting a portion of the exposed ends of said pintle sections but leaving a portion thereof still exposed that corresponds to one-half the longitudinal dimension of

said slot positioning a coil spring in said slot whereby the coil thereof is disposed in coaxial relation with respect to the sections of said pintle remaining in said leaves, and moving said divided pintle sections inwardly in said leaves and through the coil of said coil spring until the outer ends of said pintle sections are coextensive with the adjacent edges of said joined hinge leaves, whereby the inner ends of said pintle sections abut to lock said coil spring in assembled relation with said hinge leaves.

5. A method of assembling a spring hinge, comprising the steps of joining the leaves of said hinge by inserting an elongated pintle therethrough but leaving a portion of said pintle exposed on both ends of the assembled leaves, blanking out a portion of the assembled hinge leaves and pintle extending therein to divide said pintle and to form an opening, and simultaneously cutting a portion of the exposed ends of the severed sections of said pintle but leaving a portion thereof exposed that corresponds to one-half the longitudinal dimension of said opening, positioning a coil spring in said opening, and moving the divided pintle sections inwardly within said coil spring until the exposed ends thereof are coextensive within the adjacent edges of the joined hinge leaves, whereby the inner ends of said pintle sections abut to lock said coil spring in assembled relation with said hinge leaves.

6. A method of assembling a spring hinge, comprising the steps of inserting an elongated pintle through the hinge rolls of a pair of hinge leaves to pivotally join said hinge leaves, a portion of the pintle being exposed on both ends of said joined hinge leaves, blanking out a portion of said hinge leaves and pintle to divide said pintle and simultaneously cutting off opposite portions of the exposed pintle to leave predetermined opposed portions of said pintle exposed, positioning a coil spring in the blanked-out portion between the divided pintle sections, and moving the divided pintle sections inwardly within said coil spring until the pintle sections abut within the coil spring, whereby said coil spring is locked in assembled position with said leaves.

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