

[54] **FOLDING AID**
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[52] U.S. Cl. **270/61 R, 223/37, 269/254 R**
[51] Int. Cl. **B65h 45/00**
[58] Field of Search..... **270/61; 223/35, 37-38, 223/61; 269/152, 154, 157, 254**

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[57] **ABSTRACT**

A clamping device is movably mounted on an upright post at an elevated position for releasably holding a laundry article with a portion of the article extending generally downwardly so that the rest of the article may be stretched out horizontally from the clamping device. When the article is pulled, an actuator releases the article from the clamping device, and the article folds longitudinally at a retainer spaced below the clamping device. The article may then be folded transversely toward the retainer.

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8 Claims, 9 Drawing Figures

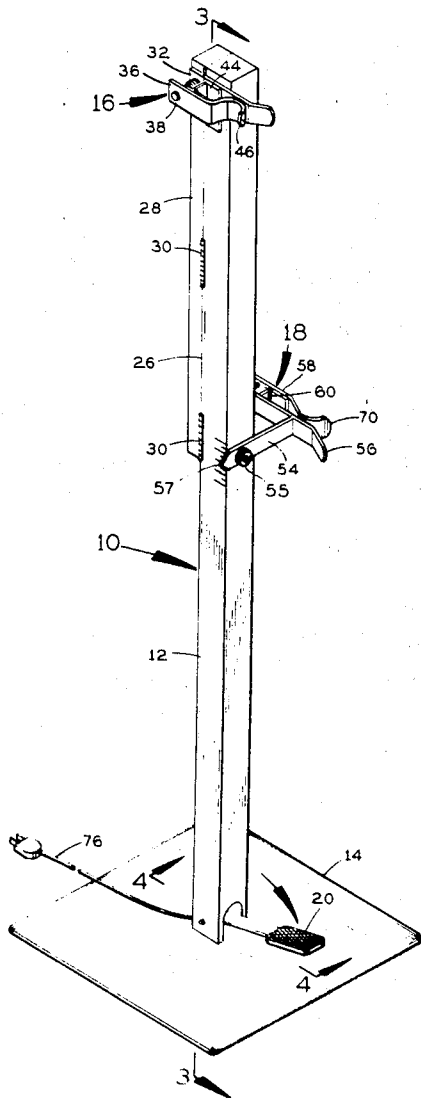


FIG. 1

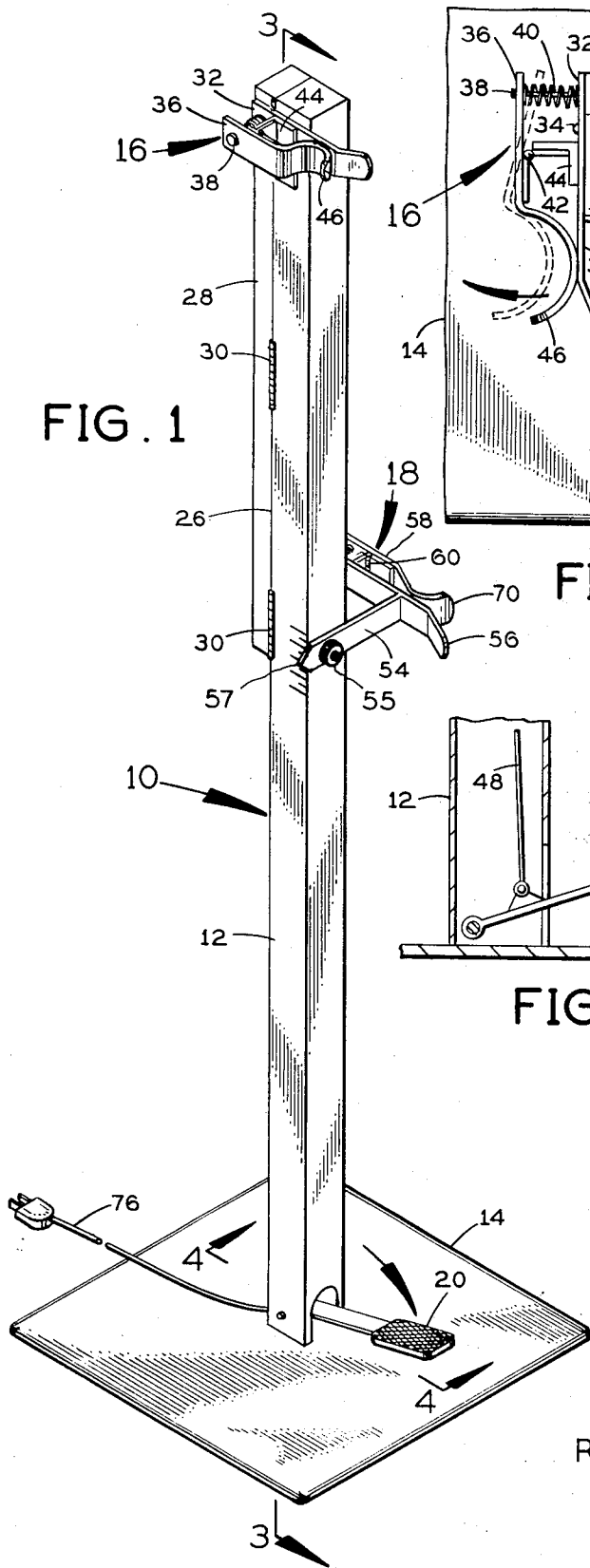


FIG. 2

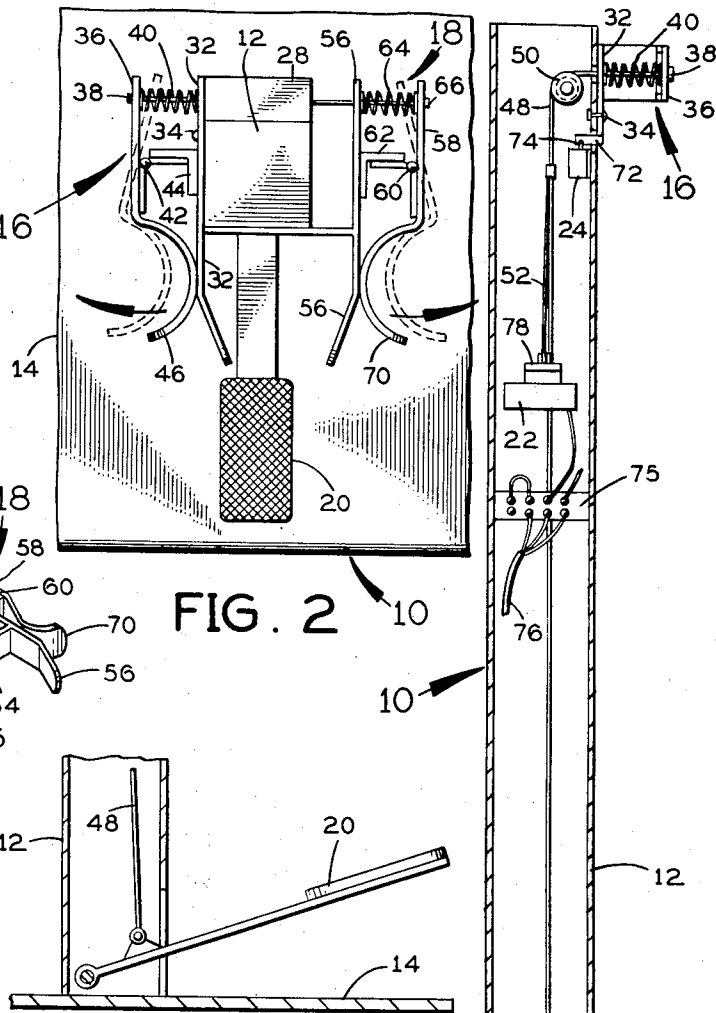


FIG. 4

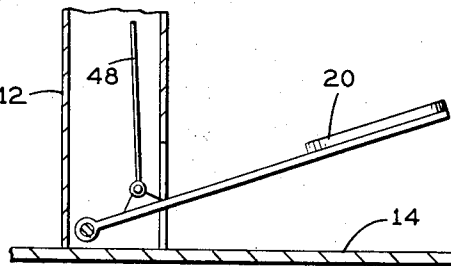
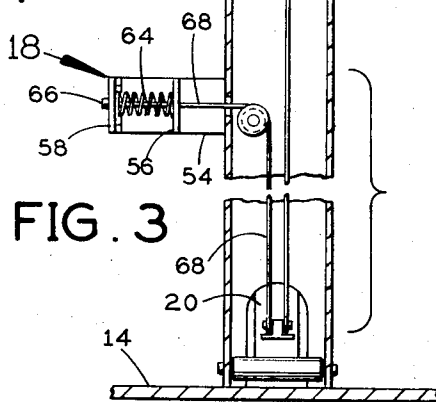


FIG. 3



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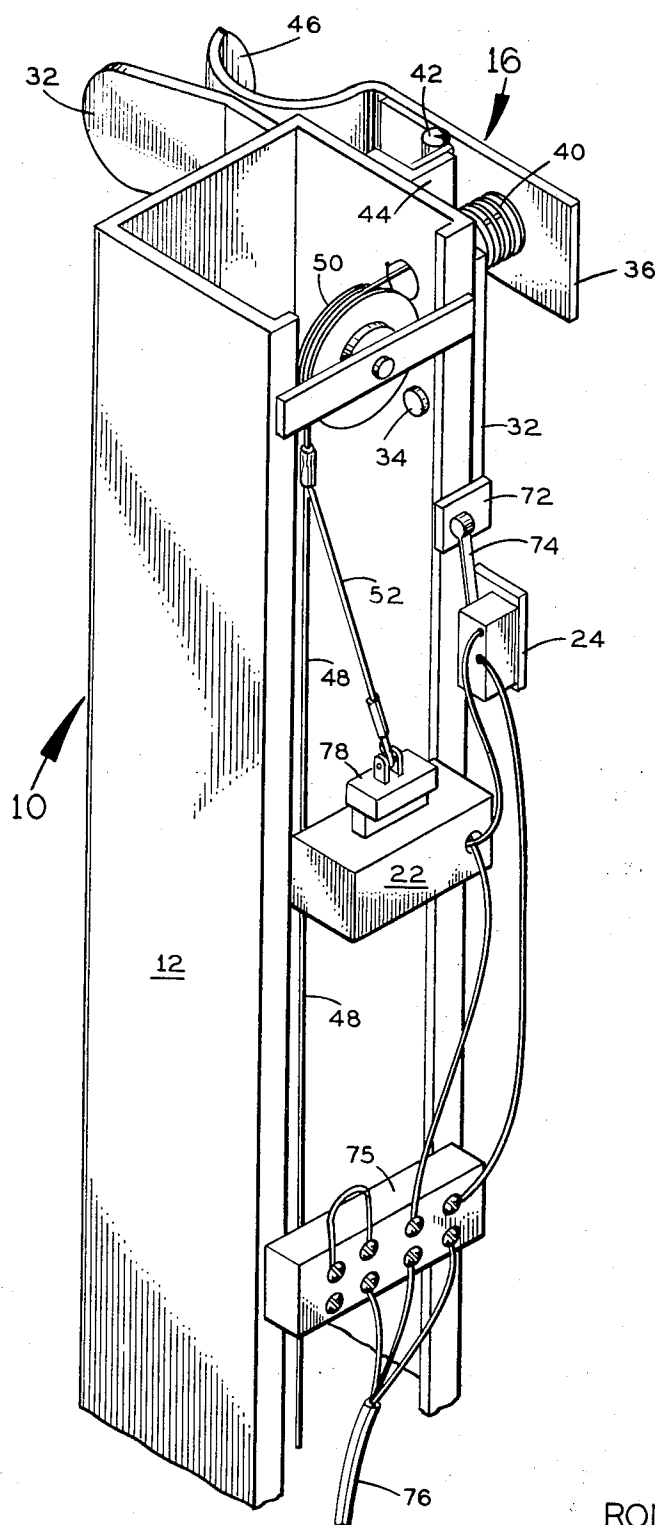


FIG. 5

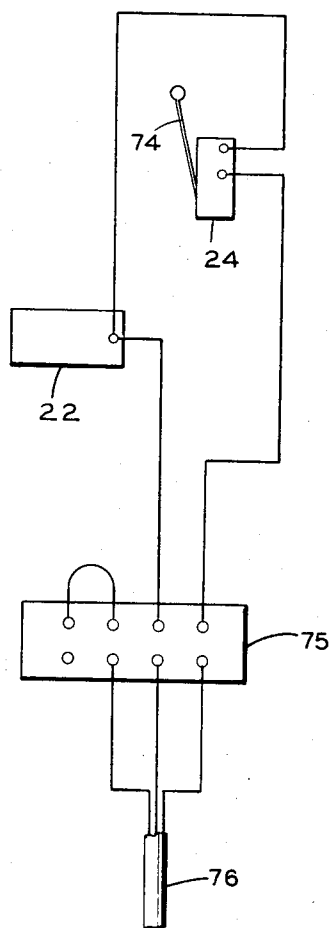
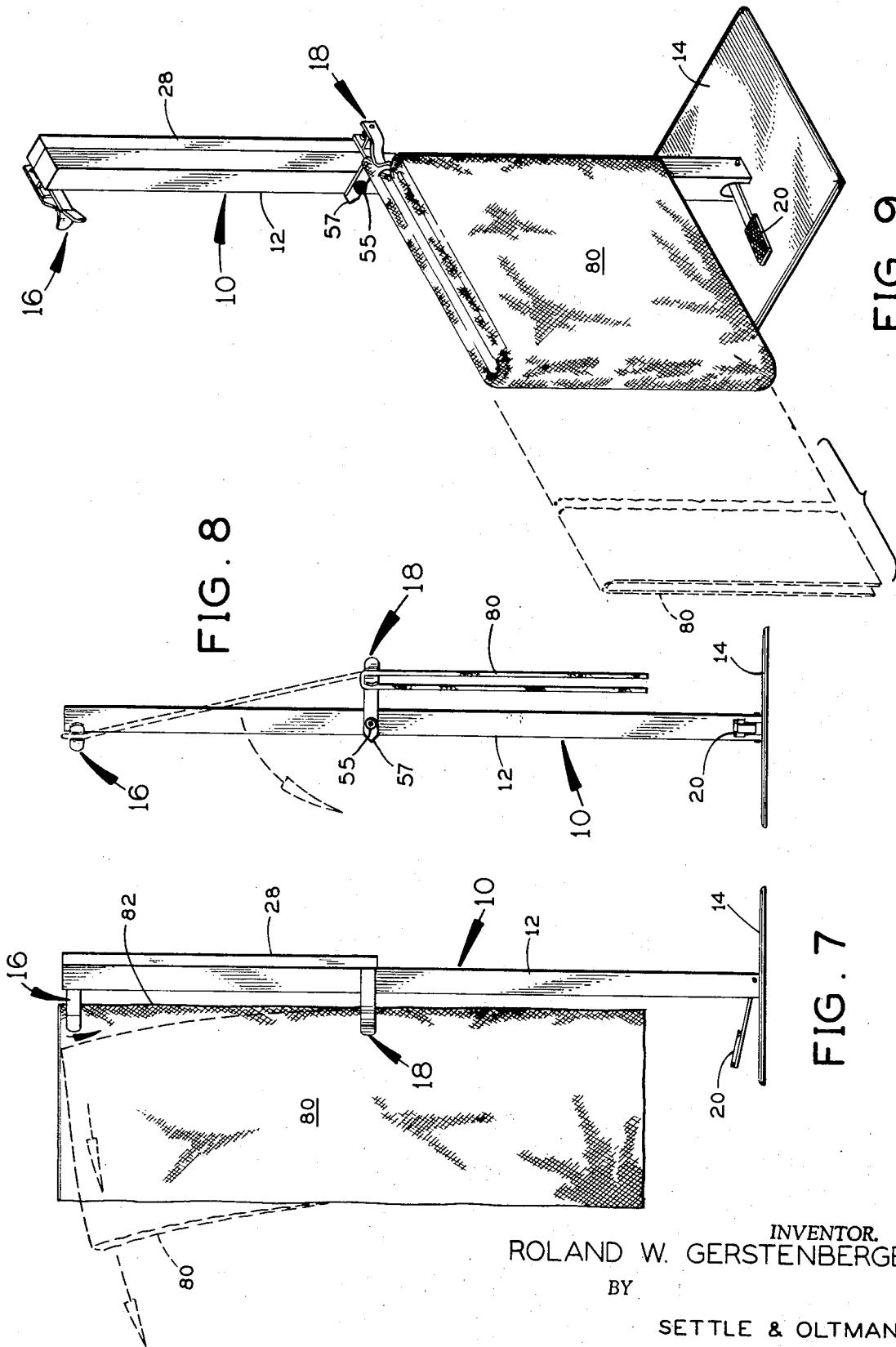


FIG. 6

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FOLDING AID**BACKGROUND OF THE INVENTION**

Various types of folding aids have been proposed to facilitate the folding of a laundry article such as a bedsheet. One known type of folding aid has a holding clamp and a folding bar mounted on a post. An article such as a sheet is held at one end by the clamp, stretched out from the clamp, and then folded transversely back toward the clamp. The partially folded article is then released from the clamp, draped over the folding bar, and folded again. The sequence of folds which results from such a folding aid and folding method is different from that which is normally followed when folding a sheet completely by hand or in completely automatic folding machinery. The normal and most desired sequence is to fold the sheet once longitudinally, fold the sheet again longitudinally, and then fold the sheet two or three times transversely. This results in a folded sheet which can be unfolded and spread most easily when making beds.

SUMMARY OF THE INVENTION

The present invention provides a folding aid which is as simple and economical to manufacture and distribute as known folding aids, which is advantageous as compared to known folding aids in that a sheet can be folded longitudinally and then transversely in the sequence most desired for folding of bed sheets, as described above, with all of the folding being accomplished by a single operator manipulating the sheet while it is held and guided by the folding aid. A preferred embodiment of the invention has a first clamp at the top of a post, and a retainer, which may be a second clamp spaced downwardly along the post. The sheet is supplied from laundry equipment with a single longitudinal fold already in it. The once-folded sheet is inserted into the clamps and stretched out from them. By pulling the sheet from the upper clamp, the upper clamp moves slightly, and this causes an actuator to release the upper clamp, so that the upper half of the sheet drops and folds at the level of the second clamp. The sheet is then folded transversely toward the second clamp, and is then released from the second clamp by operating a foot pedal.

Accordingly, it is an object of the present invention to provide an improved folding aid for use by a single operator in folding a sheet longitudinally and then transversely.

Another object of the invention is to provide a folding aid with which a sheet can initially be expanded in a generally vertical plane, and then released at the top so that the sheet folds along a horizontal line at about the midpoint of the sheet.

A further object of the invention is to provide a clamp at an upper portion of a folding aid which automatically releases a sheet or similar laundry article when the article is pulled.

Still another object of the invention is to provide a folding aid which utilizes two clamping devices as if they were extra hands to complement the hands of an operator who holds a sheet spread out from the folding aid and manipulates the sheet to fold it with the folding aid operating automatically to assist the operator.

Still another, and no less important, object of the invention is to electrically operate the upper clamping

device of the folding aid to release a laundry article in response to pulling force exerted on the article.

Other objects of this invention will appear from the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a folding aid in accordance with one embodiment of the invention;

FIG. 2 is a plan view of the folding aid with the stand partially broken away;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 1 looking in the direction of the arrows;

FIG. 4 is a fragmentary sectional view taken along line 4—4 of FIG. 1 looking in the direction of the arrows;

FIG. 5 is a fragmentary perspective view of the upper portion of the folding aid with a cover removed showing the internal construction;

FIG. 6 is a schematic wiring diagram of the electrical portion of the folding aid; and

FIGS. 7, 8 and 9 are a series of views showing major steps in the sequence of folding a sheet with the use of the folding aid.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

AS SHOWN ON THE DRAWINGS

The folding aid 10 includes an upright post 12 mounted on a base plate 14. An upper clamping device 16 is movably mounted on the post 12 near its top, and a lower clamping device 18 is mounted on the post slightly above its midpoint. There is a foot pedal 20 at the bottom of post 12 which may be depressed to open the clamping devices 16 and 18. Inside the post 12, there are a solenoid 22 and a switch 24 which are electrically operative to open the upper clamping device 16 as will be explained further.

The post 12 is a hollow rectangular tube, the upper portion of which at 26 is open at the back, the opening being closed by a cover 28 which is connected by hinges 30 to the post.

The upper clamping device 16 includes an arm 32 which is pivotally connected at a pin 34 to the post 12 to allow movement of the clamping device 16. Another arm 36 is connected to arm 32 by a pin 38, and a spring 40 urges the arms apart at their rear ends. Arm 36 is hinged at 42 to a bracket 44 mounted on arm 32. The forward end of arm 36 is curved at 46 and the curved portion 46 is urged against arm 32 by the spring 40. The pin 38 is connected to a line or cable 48 which extends into the interior of the post and runs over a pulley 50 down to the foot pedal 20. When the foot pedal 20 is depressed, cable 48 pulls the rear end of arm 36 inwardly to open the forward end 46.

The cable 48 is also connected by a branch cable 52 to the solenoid 22. When the solenoid 22 is actuated, it pulls branch cable 52 which in turn pulls cable 48 to open the clamping device 16. Thus, the solenoid and the foot pedal are alternate means for opening the clamping device 16. The lower clamping device 18 is mounted on a bracket 54 which is attached as by welding to post 12. The clamping device 18 includes an arm 56 mounted on bracket 54, and another arm 58 hinged at 60 to a bracket 62 mounted on arm 56. A spring 64 urges the rear ends of the two arms apart. A pin 66 is connected by a cable 68 to the foot pedal 20. When the foot pedal is depressed, cable 68 pulls the rear end of arm 58 inwardly causing the curved portion 70 of the arm 58 to separate from the other arm 56. Thus, depression of the foot pedal opens both clamping devices, whereas operation of the solenoid 22 opens only the upper clamping device 16.

It may be noted that arm 54 is pivotally mounted on post 12 by means of nut and bolt 55 to allow the position of clamping device 18 to be adjusted in order to accommodate sheets of different sizes. There is a pointer 57 at the rear of arm 54 cooperating with adjoining indicia on the post to indicate the size of the sheet which can be folded at a given position of device 18.

Referring to FIGS. 3 and 5, it may be seen that the whole upper clamping device 16 is movable pivotally about the pin 34. The switch 24 is mounted on the post just below the clamping device 16. Arm 32 of the clamping device 16 has a downwardly extending portion having a tab 72 which is engageable with the actuator 74 of the switch 24. When a bed sheet or other article is being held by the clamping device 16, the sheet may be pulled to pivot the upper portion of the clamping device forward. The tab 72 thus pivots rearward and depresses the actuator 74 which operates the switch 24. The switch 24 is connected in series with the solenoid 22 through a power terminal board 75 and the electrical cord 76 to a source of power which may be an ordinary 110 volt electrical outlet. When the switch 24 is operated, power flows through the solenoid 22 causing its core 78 to be pulled in. This pulls the branch cable 52 and the main cable 48 to open the upper clamping device 16.

FIGS. 7, 8 and 9 illustrate the major steps which are carried out by a single operator in folding a sheet utilizing the folding aid 10. The sheet 80 is supplied from laundry equipment which is not a part of the present invention with single longitudinal fold already in it. The fold is placed at the top of the post 12 so that the fold can be stretched out horizontally, and the vertical edge 82 of the sheet is inserted into both of the clamping devices 16 and 18 in the manner shown in FIG. 7. The sheet is thus in a generally vertical plane with the edge 82 extending between the clamping devices and a portion of the edge 82 hanging below the clamping device 18. The sheet is stretched out horizontally from the clamping devices. Then the upper fold portion of the sheet is pulled horizontally away from the clamping device 16. The pulling force does not slide the sheet out of the clamping device 16, but instead causes the clamping device 16 to pivot on the pin 34. The clamping device 16 is biased in its rest position by a spring attached to arm 34 (spring not shown), but the whole

clamping device 16 can pivot forwardly. The tab 72 then actuates switch 24 to open upper clamping device 16. The mid portion of the sheet is still held by clamping device 18, and the operator holds the other end of the sheet at the mid portion, so that the top portion of the sheet drops down and folds over the clamping device 18 as shown in FIG. 8. It may be noted that the clamping device 18 is offset laterally somewhat from the clamping device 16 so that the upper portion of the sheet 80 is initially slanted and can drop readily to the folded position shown in FIG. 8.

The partially folded sheet is shown in dotted lines in FIG. 9. From this condition, the sheet can be folded two or three times transversely toward the post 12 to complete the folding of the sheet. Then the operator steps on the foot pedal 20 to open the clamping device 18 and the sheet is removed from the folding aid and stacked.

It may be noted that the folding sequence which is carried out in folding a sheet with the use of the folding aid results in a pattern of folds in the sheet which is generally preferred by laundry operators. That is, the sheet is folded twice longitudinally and then folded transversely a number of times to obtain the final folded sheet. The folding operation requires only one operator, with the two clamping devices of the folding aid serving as an extra pair of hands to aid in the folding operation. The upper clamping device is operated automatically in response to pulling of the upper portion of the sheet, so the operator need not be close to the folding aid to operate it. Although the folding aid has advantages over known devices, it is equally as simple and economical to manufacture.

Having thus described my invention, I claim:

1. A folding aid for use in folding a laundry article comprising:
 - an upright post,
 - a clamping device movably mounted on the post at an elevated position for releasably holding a laundry article with a portion of the article extending downwardly along the post so that the article may be stretched horizontally from said clamping device,
 - electrical means responsive to movement of said clamping device produced by pulling the article to open the device and release the article, and
 - means on said post spaced below said clamping device for retaining the article when released by said clamping device so that the article folds longitudinally and may then be folded transversely toward said retaining means.
2. The folding aid as claimed in claim 1 in which said electrical means includes a solenoid connected to said clamping device to open the same, and switch means connected to said solenoid and actuated by a portion of said clamping device upon movement thereof to trip said solenoid and thereby open said clamping device.
3. The folding aid as claimed in claim 2 in which said retaining means comprises a second clamping device.
4. The folding aid as claimed in claim 3 in which said solenoid is connected to said clamping device by a line.
5. The folding aid as claimed in claim 4 including a foot pedal connected to said line for opening said first clamping device.

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6. The folding aid as claimed in claim 5 in which said foot pedal is also connected to said second clamping device by a line for opening said device.

7. The folding aid as claimed in claim 3 in which said second clamping device is adjustable to accommodate articles of different sizes and said post has indicia thereon cooperating with said second clamping device to indicate the size of article for which said second device is adjusted.

A folding aid for use in folding a laundry article comprising:

- an upright post,
- a first clamping device movably mounted on the post at an elevated position for releasably holding a laundry article with a portion of the article extending downwardly along the post so that the article may be stretched horizontally from said first clamping device,
- a second clamping device mounted at an elevated position on said post below said first clamping device and offset laterally therefrom for releasably holding a portion of the laundry article at a point spaced below said first clamping device,

line means for operating said clamping devices running vertically of said post and operatively connected to said first and second clamping devices for opening the same,

foot pedal means at the base of said post for operating said line means,

solenoid means mounted on said post and connected to said line means providing an alternate means for operating said line means,

switch means mounted on said post operative in response to movement of said first clamping device produced by pulling said article to actuate said solenoid means and thereby operate said line means to open said first clamping device and release the article,

whereby the article may be stretched horizontally out from said devices, pulled to release the same from said first clamping device, dropped to fold at said second clamping device folded transversely toward said second clamping device and released from said second device.

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