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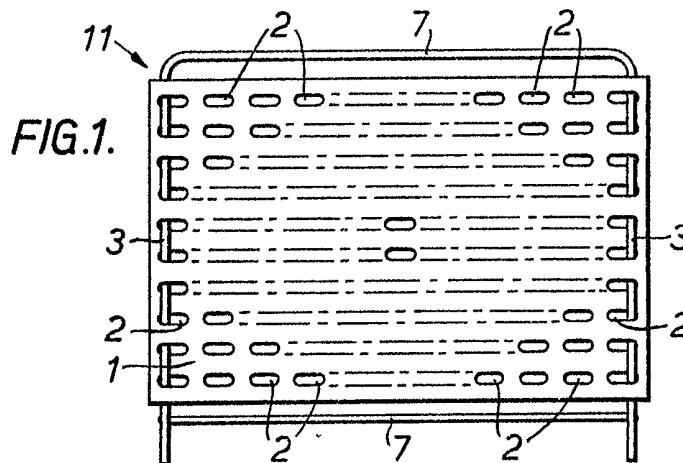
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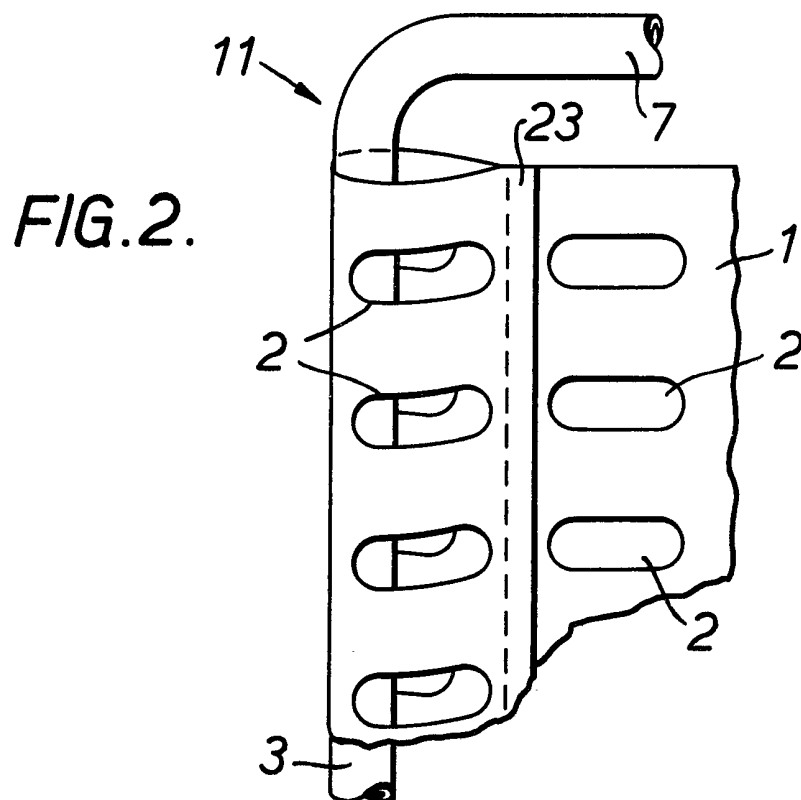
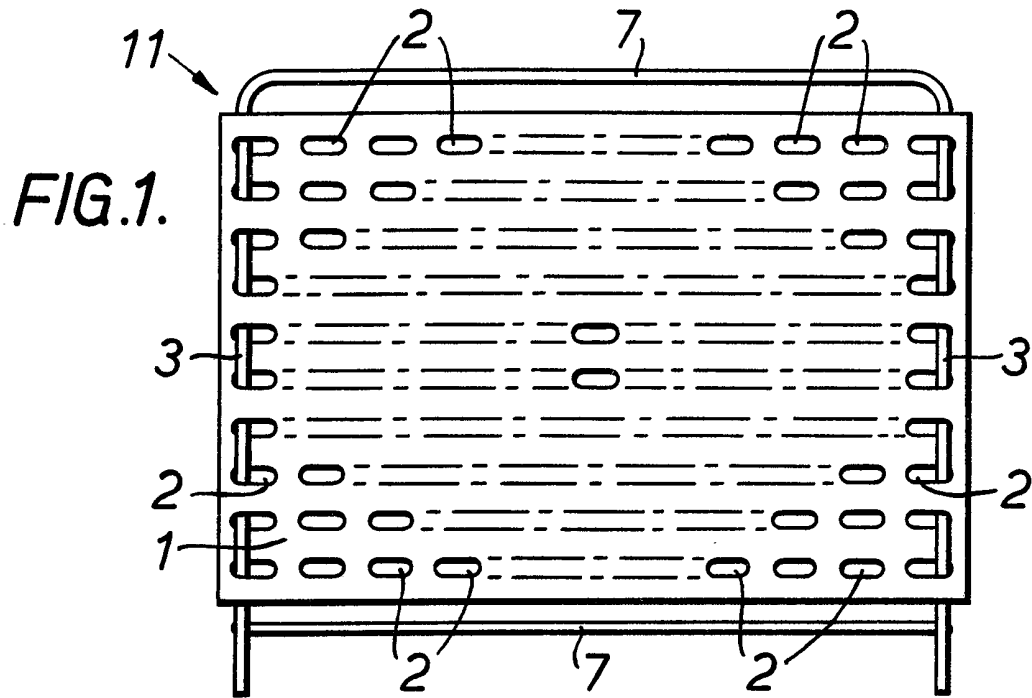
(54) Livestock hurdles

(57) A livestock hurdle (11) is provided comprising a tensioned plastics-material web (1) carried by a substantially rigid frame. The web (1) is preferably apertured. The frame includes two uprights (3) spaced by cross-bars (7) and in one embodiment the uprights (3) are connected to the web (1) by being threaded in and out of the apertures (2) provided in the web (1). In another embodiment of the

hurdle (Fig 2 not shown), the web (1) is connected to the uprights (3) by being passed therearound and fastened back onto itself. Various expedients can be used to ensure satisfactory tensioning of the web (1); thus, for example, after connection of the web (1) to the upright (3) the web (1) may be subjected to a heat treatment process to cause it to contract and become taut. Releasable clips can be provided to join the hurdles (11) together to form livestock pens or windbreaks.



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FIG. 3.

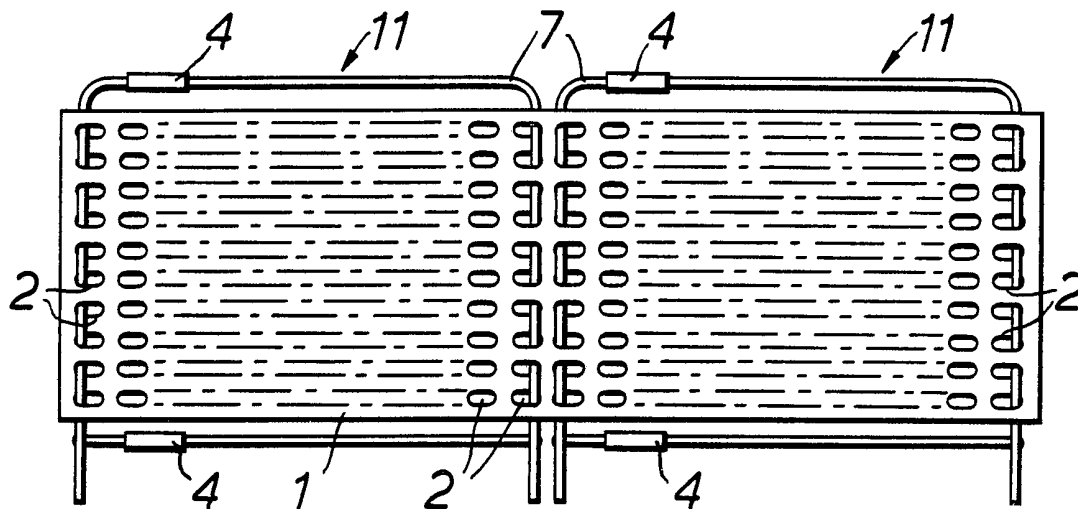
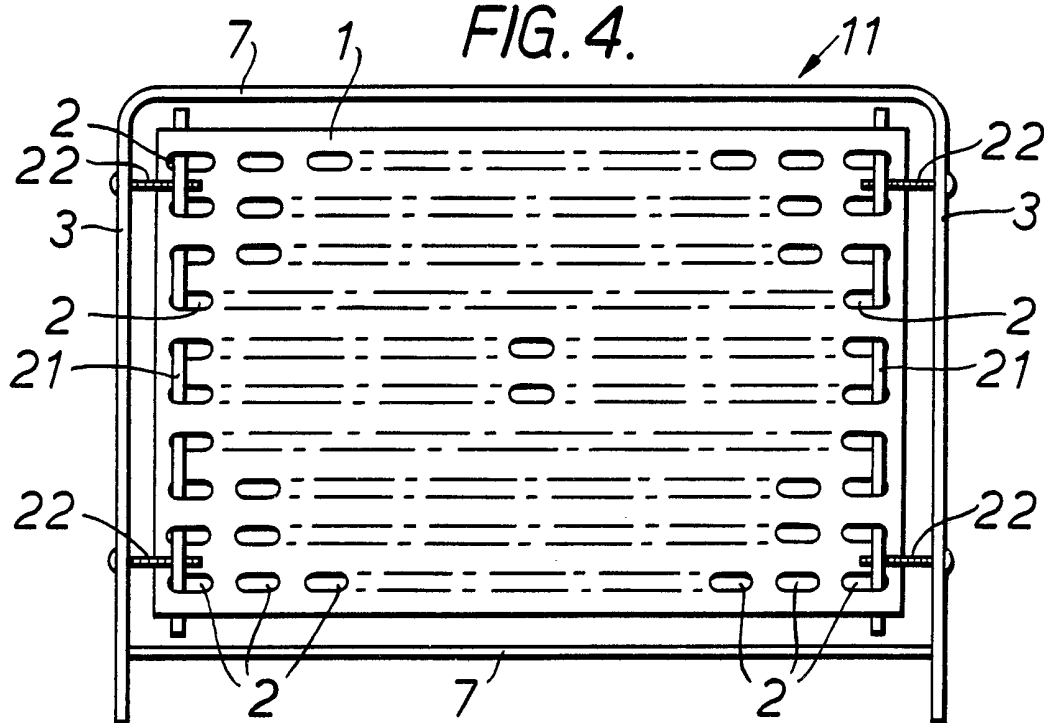


FIG. 4.



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FIG. 5.

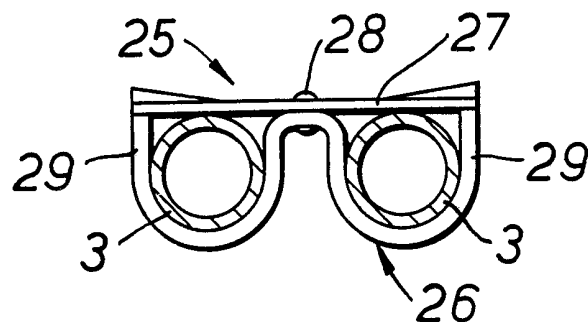


FIG. 6.

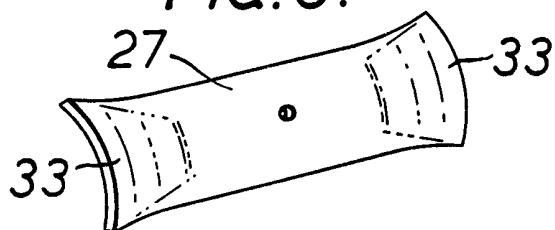


FIG. 7.

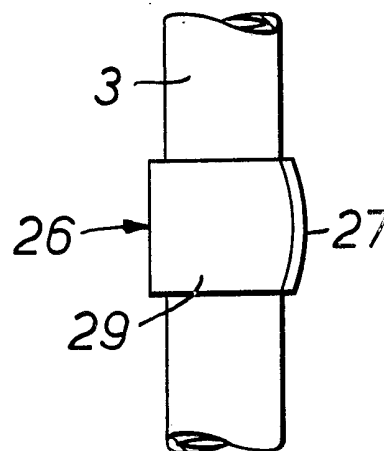


FIG. 8.

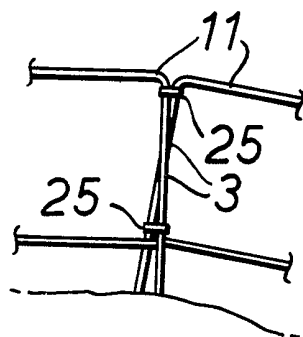
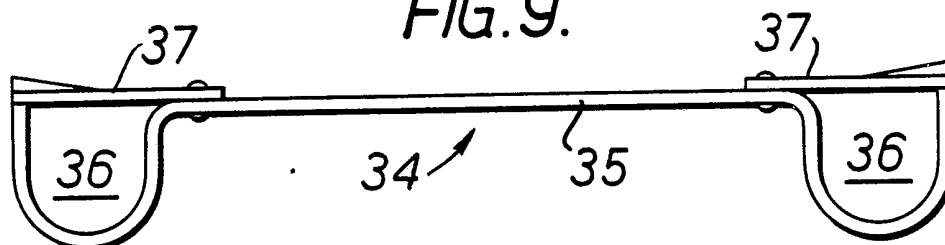


FIG. 9.



SPECIFICATION

Livestock hurdles

The present invention relates to hurdles for livestock and in particular, but not exclusively, to hurdles for use in sheep farming. The term "hurdle" as used herein is intended to include not only static hurdles but also like structures used as gates.

Afencing system has been proposed which comprises a broad web of flexible plastics material provided with transverse rows of apertures, and a plurality of fencing posts which can be threaded in and out through respective aperture rows of the web. The posts are hammered into the ground with the web supported between them. This fencing system, although suitable for uninterrupted lengths of fencing, is inconvenient to use for constructing temporary sheep pens where ease of handling and flexibility in use are of prime importance.

According to one aspect of the present invention, there is provided a livestock hurdle comprising a substantially rigid frame carrying a tensioned web of plastics material. A hurdle of this form can be made light and extremely easy to handle while being both rugged and durable.

The web is preferably provided with a plurality of rows of apertures while the frame can comprise two uprights connected by an upper and a lower cross-bar, the web being stretched directly between the uprights. The uprights can be connected to the web by being threaded in and out through the apertures of respective aperture rows; alternatively the end portions of the web can be passed around their respective uprights and fastened back on themselves.

In order to ensure satisfactory tensioning of the web a number of different approaches can be adopted. Thus for example, the length of the cross-bars can be made adjustable, or the web, instead of being carried directly by the uprights, can be carried on support bars which are connected to the uprights in a manner enabling their spacing therefrom to be adjusted. A further alternative possible with certain web materials, is to connect the web to the uprights with the former in an untensioned state and thereafter subject the web to a heat treatment process to cause it to shrink and become tensioned.

The individual hurdles can be releasably joined together to form pens by means of joining clips which preferably comprise a W-shaped seating piece and a closure bar pivoted on the central apex portion of the seating piece.

Various forms of livestock hurdle, each form embodying the invention, will now be particularly described, by way of example, with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a front elevation of a hurdle embodying the invention;

Figure 2 shows, to an enlarged scale, part of a hurdle similar to that of Figure 1 but utilising a different method of connection of a web panel of

the hurdle to the hurdle uprights;

Figure 3 is a front elevation of a string of two hurdles formed on a common length of web;

Figure 4 is a front elevation of another form of hurdle embodying the invention;

Figure 5 is a plan view of a joining clip for releasably joining together two hurdles.

Figure 6 is a perspective view of a closure bar of the joining clip;

Figure 7 is a side elevation of the joining clip;

Figure 8 is a diagram illustrating the conformation to ground slope of two hurdles joined by clips of the form shown in Figures 5 to 7, the webs of the hurdles being omitted for the sake of clarity; and

Figure 9 is a plan view of an elongate form of joining clip.

The livestock hurdle 11 shown in Figure 1 comprises a substantially-rigid tubular metal frame (for example, of aluminium or steel) carrying a tensioned web 1 of plastics material.

The frame is composed of two uprights 2 spaced and joined by two cross-bars 7. In the present embodiment, the two uprights 3 and the upper cross-bar 7 are integrally formed from a single length of tubing, the cross-bar 7 being secured to the lower ends of the uprights by any suitable method. Other forms of frame can be used for the hurdle such as, for example, a dismantlable frame composed of separate uprights 3 and cross-bars 7 which can be releasably joined together in any appropriate manner.

The web 1 is formed with a plurality of transverse rows of apertures 2, these apertures being elongate in the longitudinal direction of the web 1. The web 1 is, for example, made of polyethylene and is resiliently stretchable. A suitable form of web is manufactured by the Netlon Company under the trade name "Tensar".

The web 1 is connected to the uprights 3 by passing the latter in and out through respective lines of apertures 2 in the manner indicated in Figure 1. The insertion of the uprights 3 through the web apertures 2 is, of course, carried out before the cross-bar 7 is secured in position. For the web 1 to be in a tensioned state when carried by the frame, the spacing of the uprights 3 must be such that the web 1 has to be slightly stretched before the uprights 3 can be inserted into the selected lines of web apertures.

An alternative method of connecting the web 1 to the uprights 3 is shown in Figure 2. In this case, each end portion of the web 1 is wrapped around a corresponding one of the uprights 3 and secured back onto itself along a seam 23. Any suitable method of securing the web to itself can be used to form each seam 23; thus, for example, this seam can be formed by plastics welding, glueing, stapling, or riveting. The web 1 is kept taut while the second of the two seams 23 is formed so that in the finished hurdle the web is under a degree of tension.

Hurdles 11 using the Figure 2 method of connecting the web 1 to the uprights 3, can only

be made up as individual hurdles. In contrast however, hurdles using the Figure 1 method of connecting the web to the uprights, can be made up either individually or in strings with a number of

hurdles arranged side-by-side and utilising an uninterrupted length of web 1 (see Figure 3). The web portions intermediate the hurdles 11 of such a hurdle string constitute flexible hinges joining the hurdles together.

In describing the Figure 1 method of connection of the web 1 to the uprights 3, the pitch of the apertures 2 in the web 1 has been assumed constant since on this basis a constant spacing of the uprights 3 by the cross-bars 7 is adequate to ensure the required tensioning of the web 1. In practice, however, it has been found that the commercially available apertured webs of plastics material exhibit dimensional variations between different batches of web so that the pitch of the apertures 2 is not constant. As a result, it is not, in practice, feasible to rely on a consistent relationship between web aperture spacing and the spacing of the uprights of a standard frame, to ensure correct web tensioning. It has therefore been found expedient to adopt various methods of providing proper tensioning of the web on a standard frame without relying on the consistency of aperture pitch of web supplied by the manufacturer.

One method of ensuring satisfactory tensioning of the web is to provide a frame in which the cross-bars 7 are adjustable in length, this adjustment being effected by any suitable means 4 (Figure 3) such as a screw-threaded adjusting collar 4 which engages the facing threaded ends of two sections of the cross-bar 7 (these ends being oppositely threaded). In using such a frame, the uprights 3 would be inserted through the web apertures with the web in an untensioned state, the collars 4 being thereafter rotated to increase the spacing of the uprights 3 and thereby tension the web.

An alternative method of ensuring satisfactory tensioning of the web is to mount the web 1 between two elongate support bars 21 (Figure 4) which are connected to the uprights 3 in such a manner that the spacing of the support bars 21 and uprights 3 is adjustable. Once the bars 21 have been threaded through the web 13, each bar 21 is connected to a respective one of the uprights 3 by means of two threaded bolts 22; each bolt 22 threadedly engages with the support bar 21 or passes therethrough to engage a nut (not shown) positioned on the opposite side of the bar 21 to the adjacent upright 3. By screwing up of the bolts 22, each bar 21 can be drawn closer to its associated upright 3 thereby enabling the web 1 to be tensioned.

The above two methods of ensuring satisfactory tensioning of the web both require the use of a special frame. A further method is possible in which the web 1 is connected to the uprights 3 in an untensioned state and is thereafter subjected to a heat treatment causing it to shrink and become tensioned on the frame.

Clearly, the suitability of this method will depend on the material of the web, but it has been found that for the polyethylene "Tensar" web manufactured by Netlon, the required amount of shrinkage can be achieved by subjecting the web to temperatures in the range of 95 to 120°C for 1 to 5 minutes. Preferably, hot air is used to heat the web although the use of a water bath is also possible. Of course, instead of carrying out the shrinking of the web with the latter connected to the uprights, the web could be pre-shrunk back to a standard size on a suitable jig so that a fixed spacing of the uprights 3 is sufficient to ensure proper web tensioning; the former method is, however, preferred since the web is in an untensioned state when being connected to the uprights.

It will be appreciated that the foregoing methods of ensuring satisfactory tensioning of the web can advantageously be employed even if the Figure 2 method of connecting the web 1 to the frame uprights 3 is used, since the connecting operation can then be carried out with the web untensioned.

The individual hurdles 11 and/or the hurdle strings can be releasably joined together by means of joining clips 25 (see Figures 5 to 7). Each clip 25 comprises a W-shaped seating piece 26, and a closure bar 27 pivoted on the central apex portion of the seating piece 26 by means of a rivet or nut and bolt 28. In use of the joining clip 25, one upright 3 from each of the two hurdles (or hurdle strings) to be joined is seated in a respective one of the two seating-piece recesses defined between the central apex portion and the extreme lateral walls 29 of the seating piece. The closure bar 27 is then pivoted across these recesses to hold the uprights 3 in place. In order to releasably secure the closure bar 27 in position, both end portions 33 of the closure bar 27 are dished and the end faces of the lateral walls 29 are convexly curved in correspondence to the dishing of the bar 27. With this arrangement, when the bar 27 is in its closed position it is positively held there by the engagement of the curved end faces of the walls 29 in the concavely dished end portions 33 of the bar 27. The resilience of the bar 27 enables it to be rotated into and out of its closed position. To facilitate operation of the closure bar 27, a compression spring (not shown) can be arranged coaxially about the shaft of the bolt 28 with one end reacting against the bar 27 on its side away from the seating piece 26 and the other end of the spring reacting against the facing head of the bolt 27.

Two clips 25 are preferably used to join two hurdles 11 and to facilitate attachment of the clips to the hurdle uprights 3, the web 1 is preferably arranged to terminate short of the upper and lower cross-bars 7 thereby leaving exposed upper and lower portions of the uprights 3 to which the clips 25 can be readily attached.

When a clip 25 is attached to a hurdle, there is preferably slight play between the hurdle upright and the seating piece 26 of the clip. Due to this

play and to the independent nature of the two clips 25 used to join two hurdles 11, these hurdles can conform to changing ground slopes as is diagrammatically indicated in Figure 8.

5 An elongate form of joining clip is shown in Figure 9, this clip 34 being used to join together two hurdles 11 with their adjacent ends spaced apart, for example, by a distance sufficient to allow lambs, but not fully-grown sheep, to pass
10 between the hurdles 11). The clip 34 comprises a seating piece 35 of a form similar to the seating piece 26 of the clip 25 except that the central portion of the clip is elongate in form to space the recesses 36 of the seating piece 35 by the
15 required distance. Each end of the central portion of the seating piece 35 pivotally mounts a closure bar 37 which can be swung across the mouth of the adjacent recess 36 to secure an upright 3 in position. Each bar 37 can be retained in its closed
20 position by means similar to that shown in Figures 5 to 7.

A single sheep pen can be readily made from four hurdles 11, which can be either in the form of a hurdle string in which the hurdles 11 are joined
25 to each other by flexible web hinges, or in the form of four separate hurdles joined together by clips 25. More complex penning arrangements can easily be built and use of the elongate clip 34 of Figure 8 enables the construction of a creep
30 feeder for lambs.

CLAIMS

1. A livestock hurdle comprising a substantially rigid frame carrying a tensioned web of plastics material.

35 2. A hurdle according to Claim 1, in which the frame comprises two uprights spaced by cross-bar means, the web being stretched directly between said uprights and being provided with transverse rows of apertures extending parallel to the
40 uprights, each upright being connected with the web by being threaded in and out through the apertures of a respective said row of apertures.

3. A hurdle according to Claim 1, in which the frame comprises two uprights spaced by cross-bar means, the web being stretched directly between
45 said uprights and being connected to each upright by being passed therearound and fastened back onto itself.

4. A hurdle according to Claim 2 or Claim 3,
50 wherein the cross-bar means is adjustable in length to vary the spacing of the uprights and

thereby permit tensioning of the web as required.

5. A hurdle according to Claim 1, wherein the frame comprises two uprights spaced by cross-bar
55 means, the hurdle further comprising two elongate support bars between which the web is supported, each support bar being arranged parallel to, and being adjustably spaced from, a respective one of the uprights whereby the web can be tensioned by
60 adjustment of the spacing of the support bars from their corresponding uprights.

6. A hurdle according to Claim 2 or Claim 3, wherein the web has been tensioned by heat shrinkage following its connection to the frame
65 uprights.

7. A string of hurdles composed of hurdles in accordance with Claim 2 which are formed along a common uninterrupted length of web, the
70 portions of the web intermediate adjacent hurdles serving to flexibly interconnect said hurdles.

8. A hurdle system comprising a plurality of hurdles each in accordance with any one of the Claims 1 to 6 and/or a plurality of hurdle strings in accordance with Claim 7, and a plurality of joining
75 clips for joining together said hurdles and/or said hurdle strings.

9. A hurdle system according to Claim 8, wherein each joining clip comprises a W-shaped sealing piece having two U-shaped recesses
80 arranged to seat a frame member of a respective hurdle of two hurdles to be joined, and a closure bar pivoted on the central apex portion of the seating piece and movable into a closed position across the mouths of said U-shaped recesses
85 whereby to retain said frame members therein.

10. A hurdle system according to Claim 9, wherein the two free end portions of the seating piece of each clip and the end portions of the
90 corresponding closure bar are so formed as to cooperate to provide for snap engagement of the closure bar into its closed position.

11. A hurdle system according to Claim 9 or Claim 10, wherein the said central apex portion of one or more said clips is made elongate to space
95 apart said U-shaped recesses and thereby permit two hurdles to be connected with a substantial space therebetween, said closure bar being formed in two portions each adjacent a respective said recess.

12. A livestock substantially as hereinbefore described with reference to Figure 1, Figure 2,
100 Figure 3 or Figure 4 of the accompanying drawings.