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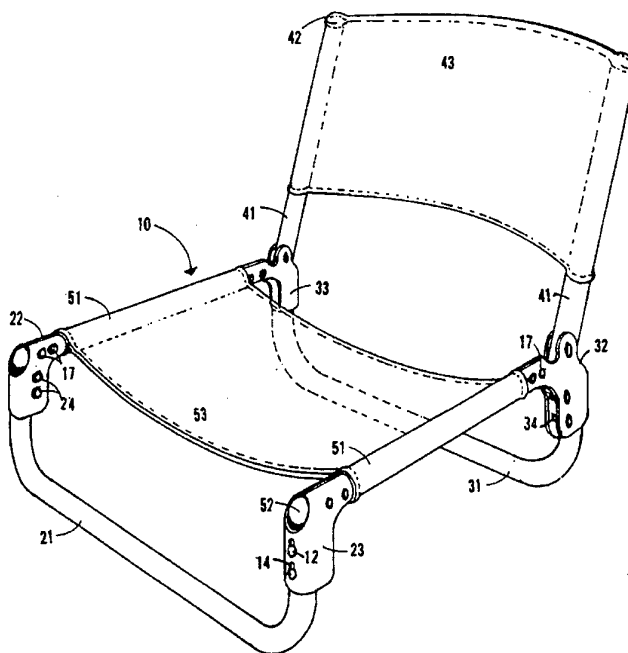
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With international search report.

(54) Title: COLLAPSIBLE CHAIR



(57) Abstract

A chair (10) has a fabric backrest (43) and seat (53) which are suspended under tension when the chair is expanded by stretcher tubes (21, 31) and support tubes (51). The chair (10) collapses by releasing the stretcher tubes (21, 31) from receiver connectors (23, 33), and rotating the stretcher tubes (21, 31) ninety degrees to be parallel with the seat support tubes (51). The back support tubes (41) also pivot down into overlying parallel relation to the stretcher tubes (21, 31) and seat support tubes (51). The chair (10) is thus easily folded into a compact carrying size. The chair (10) fits into a carrying bag or alternatively, carrying straps (19) are sewn directly onto the fabric backrest (43).

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DESCRIPTIONCOLLAPSIBLE CHAIRTechnical Field

2 This invention relates to a collapsible chair which,
5 when folded up, becomes a small convenient package for
carrying and can be readily unfolded to a usable chair
without requiring assembly of separate component parts.

Background Art

10 A large number of collapsible chairs are available
for use by the public, but unfortunately these chairs
remain awkward to carry and store and often require
assembly activities before the chairs can be utilized.
A number of U.S. patents are pertinent to, but do not
suggest, the present invention. These are U.S. Patent
15 Nos. 4,889,383; 4,890,882; 3,285,654; 3,475,050;
3,947,903; 4,577,901; 4,614,377; and 5,058,949. Other
relevant references are U.S. Patent Nos. 4,784,436,
4,889,383, 3,228,724 and 5,058,949; French Patent Nos.
1135102, 1161907, 1187222 and 1245366; Canada Patent No.
20 673237; and Italy Patent No. 424573.

Disclosure of Invention

The present invention is for a chair that can be
collapsed into a compact volume that is convenient to
transport and store. The principal objective of this
25 invention is to provide a chair capable of being
collapsed to a convenient package for carrying and be
easily unfolded for immediate use without requiring
assembly of separate components. In preferred
embodiments of this invention, the overall volume of the
30 chair is such that it can be easily inserted into a
carrying bag, or has carrying straps directly attached
to the chair itself for convenience of transportation.

The presently preferred embodiment of the
collapsible chair of this invention comprises:

- 35 an elongated first seat support member;
an elongated second seat support member having
approximately the same length;

1 a sling seat means for receiving and suspending
weight with first and second approximately parallel
sides attached at the first side to the first seat
support member and attached at the second side to the
5 second seat support member (so that the sling seat means
is suspended between the seat support members when the
seat support members are positioned approximately
parallel to each other and spaced apart by a seat
width);

10 an elongated front stretcher member, permanently
pivotably mounted at a pivot end on the front end of the
first seat support member to pivot approximately
perpendicular to the first seat support member (so that
the front stretcher member can pivot to be parallel to
15 the first seat support member and so that the free
connector end can pivot to be adjacent to the front end
of the second seat support member when the seat support
members are positioned approximately parallel to each
other and spaced apart by a seat width);

20 an elongated rear stretcher member permanently
pivotably mounted at a pivot end on the rear end of the
second seat support member to pivot perpendicular to the
second seat support member (so that the rear stretcher
member can pivot to be parallel to the second seat
25 support member and so that the free connector end can
pivot to be adjacent to the rear end of the first seat
support member when the seat support members are
positioned approximately parallel to each other and
spaced apart by a seat width);

30 a front detachable connector means for detachably
connecting the connector end of the front stretcher
member to the front end of the second seat support
member;

35 a rear detachable connector means for detachably
connecting the connector end of the rear stretcher
member to the rear end of the first seat support member
(so that connecting the connector end of the front

1 stretcher member to the front end of the second seat
support member and connecting the connector end of the
rear stretcher member to the rear end of the first seat
support member positions the seat support members
5 approximately parallel and spaced apart from each other
by approximately a seat width and suspends the sling
seat means between the seat support members).

Other objectives and advantages of this invention
will herein become obvious from the following detailed
10 description of a preferred embodiment of this invention.

Brief Description of Drawings

Figure 1 shows a perspective drawing illustrating a
presently preferred embodiment of the chair of this
invention in the expanded position for use.

15 Figure 2 shows a rear elevational cutaway view of a
pivoting leg connector.

Figure 3 shows a perspective drawing illustrating
the chair collapsing to its compact shape, or conversely
expanding for use.

20 Figure 4 shows a perspective drawing illustrating
the chair (with optional carrying handles) in a
collapsed configuration.

Figure 5 shows a perspective drawing illustrating an
alternative preferred embodiment of the chair collapsing
25 to its compact configuration, or conversely expanding
for use.

Figure 6 shows a top elevational view of the
embodiment of Figure 5 in the collapsed configuration.

Figure 7 shows a side elevational view of the
embodiment of Figure 5 in the collapsed configuration.
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Best Mode for Carrying Out Invention

Figure 1 shows the presently preferred embodiment of
the chair in its usable expanded configuration 10 with a
front leg and stretcher tube 21 pivotably attached at a
35 pivot end to a front leg pivoting connector 22, and a
rear leg and stretcher tube 31 pivotably attached at a
pivot end to a rear leg pivoting connector 32, for

1 pivoting approximately perpendicular to the seat support
tubes 51. Each of the leg and stretcher tubes 21, 31
comprises an elongated stretcher portion with two leg
portions that function as legs attached to either side
5 of the stretcher portion. Free connector ends of the
front leg and stretcher tube 21 and rear leg and
stretcher tube 31 are locked into position into the
opposite front leg receiver connector 23 and the
opposite rear leg receiver connector 33 by the stud
10 connectors 12 and the stud receiver slots 14, forming a
rigid connection. Endcaps 18 on the connector ends are
shaped to mate with "U" shaped portions of the leg
receiver connectors 23, 33. The front leg connectors
22, 23 are rigidly attached to the seat support tube 51
15 by securement means 17. The rear leg connectors 32, 33
are also rigidly attached to the seat support tube 51 by
securement means 17. Back support tubes 41 with endcaps
42 are connected to the rear leg connectors 32, 33, and
pivot upward providing support for the fabric sling
20 backrest 43 which wraps around the back support tubes 41
and is preferably sewn to itself. The seat support
tubes 51, which have endcaps 52, provide support for the
fabric sling seat 53 which wraps around the seat support
tubes 51 and is preferably sewn to itself. With the
25 chair expanded, the fabric sling seat 53 and the fabric
sling backrest 43 are suspended to receive weight.

Figure 2 illustrates the stop means 16 interfacing
with the flanges of pivoting connectors 22, 32 providing
a positive rotational stop. The stop means 16 also
30 cooperates with the connector bushings 24, 34 to lock
the leg and stretcher tubes 21, 31 to the pivoting leg
connectors 22, 32.

Figure 3 illustrates the chair in a perspective
view, showing the action of the components in the
35 process of expanding the chair for use or folding the
chair into a compact configuration. When folding the
chair into a compact configuration, stud connectors 12

1 are released from the stud receiver slots 14. The front
leg and stretcher tube 21 and the rear leg and stretcher
tube 31 swivel within the front leg pivoting connector
22 and the rear leg pivoting connector 32. The front
5 leg and stretcher tube 21 and the rear leg and stretcher
tube 31 swivel ninety degrees to be in alignment with
the seat support tubes 51 to which they are attached.
The back support tubes 41 pivot downward to become
parallel with the seat support tubes 51.

10 Figure 4 illustrates, in a perspective view, the
chair configured in its compact configuration, wherein
all of the support tubes are parallel with one another.
The fabric slings 43, 53 are folded so that the support
tubes are closely stacked together.

15 In expanding the preferred embodiment of the chair
(as shown in Figure 3), the front leg and stretcher tube
21 and the rear leg and stretcher tube 31 swivel within
the leg pivoting connectors 22, 32, which have a "U"
shaped housing configuration, with connector bushings
20 24, 34 secured through the "U" shaped housing, thereby
forming a space in which the leg and stretcher tubes 21,
31 swivel. Fastened to the leg and stretcher tubes 21,
31 is a stop means 16 (as shown in Fig. 2) which
cooperates with the connectors' "U" shape, allowing only
25 a ninety degree rotation. This stop means 16 also
cooperates with connector bushings 24, 34 to retain the
leg and stretcher tubes 21, 31 vertically within the
connector assembly. As the leg and stretcher tubes 21,
31 swivel ninety degrees in relationship to the seat
30 support tube 51 to which they are connected by way of
the leg pivoting connectors 22, 32, the leg and
stretcher tubes 21, 31 swivel into the open portion of
the "U" shaped leg receiver connectors 23, 33 on the
opposite sides of the chair. As the connector ends of
35 leg and stretcher tubes 21, 31 continue into the
connector housings, stud connectors 12 on the connector
ends enter into stud receiver slots 14 in the connector

1 housings (which have a narrowing interlock
configuration). The stud connectors 12 protrude through
the receiver slots 14 with the heads of the stud
connectors locking into the narrow portion of the stud
5 receiver slots 14. The endcaps 18 on the connector ends
of the leg and stretcher tubes 21, 31 are configured to
mate with the "U" shape of the connector housing,
thereby limiting rotational movement. Diagonal racking
action or wobbling of the chair is controlled by the
10 rotation limiting stop means 16 and by the stud
connector 12 attachment as well as the configuration of
the endcap 18 of the leg interfacing with the "U" shaped
connector housing. The leg connectors 22, 23, 32, 33
are thus firmly attached to the seat support tubes 51
15 forming a rigid frame.

The rear leg connectors 32, 33 have in their upward
portion, pivoting connector means for securing the back
support tube 41. The back support tubes 41 pivot about
the rear leg connectors 32, 33 from a position parallel
20 to the seat support tube 51 to an upward position. In
the upward position, the bottom of the back support tube
41 bears against the endcap (not shown) of the seat
support tube 51, providing a positive stop for the back
support tube 41. From the back support tubes 41, a
25 fabric sling backrest 43 is attached by wrapping the
fabric around the tube and preferably sewing the fabric
to itself. From the seat support tubes 51, a fabric
sling seat 53 is supported which wraps around the seat
support tubes 51 and is preferably sewn to itself.

30 In the expanded configuration (as shown in Figure
1), the front and rear leg and stretcher tubes 21, 31
have been swiveled to a position ninety degrees from the
seat support tubes 51 and interlocked with the opposite
leg connectors 23, 33 which creates a seat width
35 distance between the seat support tubes 51, thereby
forming a spaced apart frame from which the fabric sling
seat 53 is suspended. From this expanded frame

1 configuration, the back support tubes 41 are pivoted
upward to a substantially vertical position, thereby
providing supports, spaced a seat width apart, from
which a fabric sling backrest 43 is suspended.

5 In collapsing the chair (as shown in Figure 3), the
back support tubes 41 swivel about a pivot connector on
the upper portion of the rear connectors 32, 33, and the
back support tubes 41 swivel so that they are parallel
and adjacent to the seat support tubes 51. The front
10 leg and stretcher tube 21 is then released from the stud
receiver slots 14 and swivels toward the rear, ninety
degrees until it is parallel with and adjacent to
(under) the seat support tube 51 to which it is
attached. The rear leg and stretcher tube 31 is then
15 released from the stud receiver slots 14 and swivels in
a forward direction ninety degrees until the rear leg
support tube 31 is parallel with and adjacent (under)
the seat support tube 51 to which it is attached. With
the support and stretcher tubes thus aligned, adjacent
20 and parallel, the fabric sling backrest 43 and fabric
sling seat 53 are wrapped around the tubes. Thus, the
chair collapse into a compact configuration 11 (as shown
in Figure 4), wherein the overall width of the chair in
the collapsed configuration is the width of two of the
25 connectors. For ease in carrying the collapsed chair,
carrying straps 19 optionally could be incorporated into
the design of the fabric sling backrest. Alternatively,
the compact assembly could easily slip into a carrying
bag for ease of handling.

30 Figure 5 illustrates, in a perspective view, an
alternative preferred embodiment of the chair of this
invention in which both the front and back leg and
stretcher tubes swivel from the front and rear ends of
one seat support tube. Except as specified otherwise,
35 the parts correspond to the parts in the embodiment
described previously and have accordingly been similarly
labelled.

1 One side of the chair comprises a connector seat
support tube 51-1 with a front pivoting connector 22
attached at the front and a rear pivoting connector 32
attached at the rear. A front leg and stretcher tube 21
5 is pivotably attached to the front pivoting connector 22
at one end and pivots forward from a position
substantially aligned under the connector seat support
tube 51-1 approximately ninety degrees to a position
approximately perpendicular to the connector seat
10 support tube 51-1. A rear leg and stretcher tube 31 is
pivotably attached to the rear pivoting connector 32 at
a pivot end and pivots rearward from a position
substantially aligned under the connector seat support
tube 51-1 approximately ninety degrees to a position
15 approximately perpendicular to the connector seat
support tube 51-1. Fastened to the leg and stretcher
tubes 21, 31 is a stop means 16 (as shown in figure 2)
which cooperates with the pivoting connectors 22, 32
allowing a maximum approximately ninety degree rotation.
20 This stop means 16 also cooperates with the connectors
21, 31 to retain the leg and stretcher tubes 21, 31
vertically within the leg connectors 22, 32.

Positioned on the opposite side of the chair,
substantially parallel to seat support tube 51-1 and
25 spaced apart by the length of the stretcher tubes 21,
31, is a receiver seat support tube 51-2 with a front
receiver connector 23 attached to the front of the tube
51-2 and a rear receiver connector 33 attached at the
rear of the tube 51-2.

30 The free connector end of the front leg and
stretcher tube 21 is mated with the front leg receiver
connector 23 attached to the seat support tube 51-2 and
the connector studs 12 are locked into the stud receiver
slots 14.

35 The free connector end of the rear leg and stretcher
tube 31 is mated with the rear leg receiver connector 33
attached to the rear end of the seat support tube 51-2

1 and the connector studs 12 are locked into the stud
receiver slots 14. Between the seat support tubes 51-1
and 51-2, a fabric sling seat is suspended by wrapping
the fabric around the seat support tubes and sewing the
5 fabric to itself.

When folding this alternative embodiment into a
compact configuration, the back support tubes 41 pivot
downward to become parallel with the connector seat
support tube 51-1 and receiver seat support tube 51-2.
10 Stud connectors 12 are released from the stud receiver
slots 14 in the front receiver connector 23, and the
rear receiver connector 33. The front leg and stretcher
tube 21 swivels within the front leg pivoting connector
22 and the rear leg and stretcher tube swivels within
15 the rear leg pivoting connector 32 with both connectors
being attached to seat support tube 51-1.

The front leg and stretcher tube 21-1 swivels
rearward to be in substantial alignment with and under
the seat support tube 51-1. The rear leg and stretcher
20 tube 31 swivels forward to a position parallel to front
leg and stretcher tube 21 substantially under support
tube 51-1.

The fabric sling backrest 43 and the fabric sling
seat 53 are wrapped around the connector seat support
25 tube 51-1 and the receiver seat support tube 51-2 and
the front and rear leg and stretcher tubes 21 and 31
collapsing the chair to a dimension easily carried
similar in configuration as illustrated in figure 4.

Figure 6 illustrates the alternate preferred
30 embodiment from a top view, the front and rear leg and
stretcher tubes swiveled to a compacted position about
the seat support tube with pivoting connectors at each
end 51-1. The front leg and stretcher tube 21 swivels
within front leg pivoting connector 22, rearward under
35 seat support tube with pivoting connectors at each end
51-1. The rear leg and stretcher tube 31 is swiveled
forward until it is parallel with the front leg and

1 stretcher tubes 21 and substantially under the seat
support tube 51-1.

Figure 7 illustrates the alternative preferred
embodiment in a side view, with the front and rear
5 stretcher tubes swiveled to a compacted position about
the seat support tube with pivot connectors at each end
51-1. The front elongated leg and stretcher tube 21
increases the height of the front of the chair. The
rear shorter leg and stretcher tube 31 reduces the
10 height of the back of the chair. The front legs being
taller than the rear legs creates a preferred rearward
slope to the seat support tubes 51-1 and 51-2 when the
chair is the use position. The ninety degree
relationship between the leg portion of the leg and
15 stretcher tube and the seat support make possible the
compact folding configuration. The length of the leg
and stretcher tubes 21 and 31 are shorter than the seat
support 51-1 and 51 -2 for compact folding with the leg
and stretcher tubes folding under and substantially
20 aligned with the seat support tube 51-1.

The chair in its usable expanded position has seat
support tubes 51-1, 51-2 parallel to one another spaced
apart a seat width approximately equal to the length of
the stretcher portion of the leg and stretcher tubes 21,
25 31. The leg portions of the leg and stretcher tubes 21,
31 pivot around an axis perpendicular to the seat
support tubes 51-1, 51-2 until the stretcher portions of
the leg and stretcher tubes 21, 31 are perpendicular to
the support tubes 51-1, 51-2. The rear leg connectors
30 32, 33 have in their upward portion pivoting connector
means for securing the back support tube 41. The back
support tubes 41 pivot about the rear leg connectors 32,
33 from a position parallel to the seat support tubes
51-1, 51-2 to an upward position.

35 In the upward position the bottom of the back
support tube 41 bears against the end cap (not shown) of
the seat support tube 51-1, 51-2 providing a stop for

1 back support tubes 41. A fabric sling backrest 43 is
attached by wrapping the fabric around the back support
tubes 41 and sewing the fabric to itself.

As illustrated in Figure 7, the front leg and
5 stretcher tube with an elongated leg portion 21-1
increases the height of the front of the chair.
Similarly the rear leg and stretcher tube with a
shortened leg portion 31 reduces the height of the back
of the chair.

10 The connectors between the seat support tubes 51-1,
51-2 and the leg and stretcher tubes 21, 31 occur at the
horizontal and vertical ends of those tubes.
Accordingly, the height, width and depth of the chair
can be varied simply by varying the lengths of the
15 various tubes.

It should now be apparent that the collapsible chair
described above possesses unique attributes as set forth
in the summary of the invention. Because the chair can
be modified to some degree without departing from the
20 principles as they have been outlined and explained in
this specification, this invention should be understood
to encompass all such modifications as fall within the
scope and spirit of the following claims. Accordingly,
no limitations shall be implied or inferred except as
25 specifically and explicitly set forth in the attached
claims.

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CLAIMS

What is claimed is:

1. A collapsible chair that can be expanded for use without assembling separate components, comprising:

5 an elongated first seat support member having a seat support length, a front end and a rear end;

an elongated second seat support member having a length approximately equal to said seat support length, a front end and a rear end;

10 sling seat means for receiving and suspending weight having first and second approximately parallel sides attached at said first side to said first seat support member and attached at said second side to said second seat support member, whereby said sling seat means is
15 suspended between said seat support members when said seat support members are positioned approximately parallel to each other and spaced apart by a seat width;

an elongated front stretcher member having a pivot end and a connector end defining a stretcher member
20 length, permanently pivotably mounted at said pivot end on the front end of said first seat support member to pivot about a front stretcher member axis approximately perpendicular to said first seat support member, whereby said front stretcher member can pivot to be parallel to
25 said first seat support member and whereby said connector end of said front stretcher member can pivot to be adjacent to said front end of said second seat support member when said seat support members are positioned approximately parallel to each other and
30 spaced apart by approximately said seat width;

an elongated rear stretcher member having a pivot end and a connector end spaced apart by approximately said stretcher member length permanently pivotably mounted at said pivot end on the rear end of said second
35 seat support member to pivot about a rear stretcher member axis approximately perpendicular to said second seat support member, whereby said rear stretcher member

1 can pivot to be parallel to said second seat support
member and whereby said connector end of said rear
stretcher member can pivot to be adjacent to said rear
end of said first seat support member when said seat
5 support members are positioned approximately parallel to
each other and spaced apart by approximately said seat
width;

front detachable connector means for detachably
connecting said connector end of said front stretcher
10 member to said front end of said second seat support
member;

rear detachable connector means for detachably
connecting said connector end of said rear stretcher
member to said rear end of said first seat support
15 member;

whereby connecting said connector end of said front
stretcher member to said front end of said second seat
support member and connecting said connector end of said
rear stretcher member to said rear end of said first
20 seat support member positions said seat support members
approximately parallel and spaced apart from each other
by approximately said seat width and suspends said sling
seat means between said seat support members.

2. A chair according to claim 1, wherein each of
25 said stretcher members comprises:

a combined leg and stretcher structure comprising a
horizontal stretcher portion having said stretcher tube
length and vertical leg portions attached to opposite
ends of said horizontal stretcher portion.

30 3. A chair according to claim 1, further
comprising:

an elongated first back support member having a
bottom end and a top end permanently pivotably mounted
at said bottom end to said rear end of said first seat
35 support member to pivot about a first back support axis
perpendicular to said front stretcher member axis and
perpendicular to said first seat support member;

1 an elongated second back support member having a
bottom end and a top end permanently pivotably mounted
at said bottom end to said rear end of said second seat
support member to pivot about a second back support axis
5 perpendicular to said rear stretcher member axis and
perpendicular to said second seat support member; and
sling backrest means for receiving and suspending
weight having first and second approximately parallel
sides attached at said first side to said first back
10 support member and attached at said second side to said
second back support member, whereby said sling backrest
means is suspended between said back support members
when said back support members are positioned
approximately parallel to each other and spaced apart by
15 approximately said seat width.

4. A chair according to claim 1, wherein said
front detachable connector means further comprises first
locking means for locking said connector end of said
front stretcher member to said front end of said second
20 seat support member when they are connected; and

wherein said rear detachable connector means further
comprises second locking means for locking said
connector end of said rear stretcher member to said rear
end of said first seat support member when they are
25 connected.

5. A chair according to claim 1, wherein said seat
support members and said backrest support members
comprise hollow tubes.

6. A chair according to claim 1, wherein said
30 stretcher members comprise hollow tubes.

7. A chair according to claim 1, wherein said
stretcher member length is approximately equal to said
seat width.

8. A collapsible chair that can be expanded for
35 use without assembling separate components, comprising:

an elongated first seat support tube having a seat
support length, a front end and a rear end;

1 an elongated second seat support tube having a
length approximately equal to said seat support length,
a front end and a rear end;

5 a fabric sling seat having first and second
approximately parallel sides attached at said first side
to said first seat support tube and attached at said
second side to said second seat support tube, whereby
said fabric sling seat is suspended between said seat
support tubes when said seat support tubes are
10 positioned approximately parallel to each other and
spaced apart by a seat width;

15 an elongated front stretcher tube having a pivot end
and a connector end defining a stretcher tube length,
permanently pivotably mounted at said pivot end on the
front end of said first seat support tube to pivot about
a front stretcher tube axis approximately perpendicular
to said first seat support tube, whereby said front
stretcher tube can pivot to be parallel to said first
seat support tube and whereby said connector end of said
20 front stretcher tube can pivot to be adjacent to said
front end of said second seat support tube when said
seat support tubes are positioned approximately parallel
to each other and spaced apart by approximately said
seat width;

25 an elongated rear stretcher tube having a pivot end
and a connector end spaced apart by approximately said
stretcher tube length permanently pivotably mounted at
said pivot end on the rear end of said second seat
support tube to pivot about a rear stretcher tube axis
30 approximately perpendicular to said second seat support
tube, whereby said rear stretcher tube can pivot to be
parallel to said second seat support tube and whereby
said connector end of said rear stretcher tube can pivot
to be adjacent to said rear end of said first seat
35 support tube when said seat support tubes are positioned
approximately parallel to each other and spaced apart by
approximately said seat width;

1 a front leg receiver connector having a front receiver slot mounted on said front end of said second seat support tube;

5 a front stud connector configured to be engaged in said front receiver slot mounted on said connector end of said front stretcher tube;

 a rear leg receiver connector having a rear receiver slot mounted on said rear end of said first seat support tube;

10 a rear stud connector configured to be engaged in said rear receiver slot mounted on said connector end of said rear stretcher tube;

 whereby pivoting said connector end of said front stretcher tube adjacent to said front end of said second seat support tube and pivoting said connector end of said rear stretcher tube to said rear end of said first seat support tube and engaging said front stud connector in said front receiver slot and said rear stud connector in said rear receiver slot positions said seat support tubes approximately parallel and spaced apart from each other by approximately said seat width and suspends said fabric sling seat means between said seat support tubes;

20 an elongated first back support tube having a bottom end and a top end permanently pivotably mounted at said bottom end to said rear end of said first seat support tube to pivot about a first back support axis perpendicular to said front stretcher tube axis and perpendicular to said front stretcher tube;

25 an elongated second back support tube having a bottom end and a top end permanently pivotably mounted at said bottom end to said rear end of said second seat support tube to pivot about a second back support axis perpendicular to said rear stretcher tube axis and perpendicular to said rear stretcher tube; and

35 a fabric sling backrest having first and second approximately parallel sides attached at said first side to said first back support tube and attached at said

1 second side to said second back support tube, whereby
said fabric sling backrest is suspended between said
back support tubes when said back support tubes are
positioned approximately parallel to each other and
5 spaced apart by approximately said seat width.

9. A chair according to claim 8, wherein each of
said stretcher members comprises:

a combined leg and stretcher structure comprising a
horizontal stretcher portion having said stretcher tube
10 length and vertical leg portions attached to opposite
ends of said horizontal stretcher portion.

10. A chair according to claim 9, wherein said
stretcher tube length is sufficiently different from
said seat support length to allow said vertical leg
15 portions adjacent to said connector ends to avoid
hitting said seat support ends when said stretcher tubes
are pivoted to be parallel to said seat support members.

11. A chair according to claim 8, further
comprising:

20 rotational stop means mounted adjacent to said pivot
ends of said stretcher tubes for limiting pivoting of
said stretcher tubes to approximately ninety degrees
from said seat support tubes.

12. A collapsible chair that can be expanded for
25 use without assembling separate components, comprising:

first and second elongated seat support members,
each having a receiver end and a pivot end;

front and rear elongated stretcher members, each
having a swivel end and a connector end, each having a
30 stretcher member length, and each pivotably mounted at
said swivel end to a corresponding seat support member
at its pivot end;

detachable connecting means for detachably
connecting each of said connector ends to a
35 corresponding receiver end; and

sling seat means having two approximately parallel
edges spaced apart by approximately said stretcher

- 1 member length attached at said edges to said stretcher members, whereby said sling seat means is suspended between said seat support members when said connector ends are connected to corresponding receiver ends.
- 5 13. A collapsible chair that can be expanded for use without assembling separate components, comprising:
an elongated connector seat support member having a seat support length, a front end and a rear end;
an elongated receiver seat support member having a
10 length approximately equal to said seat support length, a front end and a rear end;
sling seat means for receiving and suspending weight having first and second approximately parallel sides attached at said first side to said connector seat support member and attached at said second side to said
15 receiver seat support member, whereby said sling seat means is suspended between said seat support members when said seat support members are positioned approximately parallel to each other and spaced apart by
20 a seat width;
an elongated front stretcher member having a pivot end and a connector end defining a stretcher member length, permanently pivotably mounted at said pivot end on the front end of said connector seat support member
25 to pivot about a front stretcher member axis approximately perpendicular to said connector seat support member, whereby said front stretcher member can pivot to be parallel to said connector seat support member and whereby said connector end of said front
30 stretcher member can pivot to be adjacent to said front end of said receiver seat support member when said seat support members are positioned approximately parallel to each other and spaced apart by approximately said seat width;
35 an elongated rear stretcher member having a pivot end and a connector end spaced apart by approximately said stretcher member length permanently pivotably

1 mounted at said pivot end on the rear end of said
connector seat support member to pivot about a rear
stretcher member axis approximately perpendicular to
said connector seat support member, whereby said rear
5 stretcher member can pivot to be parallel to said
connector seat support member and whereby said connector
end of said rear stretcher member can pivot to be
adjacent to said rear end of said receiver seat support
member when said seat support members are positioned
10 approximately parallel to each other and spaced apart by
approximately said seat width;

front detachable connector means for detachably
connecting said connector end of said front stretcher
member to said front end of said receiver seat support
15 member;

rear detachable connector means for detachably
connecting said connector end of said rear stretcher
member to said rear end of said receiver seat support
member;

20 whereby connecting said connector end of said front
stretcher member to said front end of said receiver seat
support member and connecting said connector end of said
rear stretcher member to said rear end of said receiver
seat support member positions said seat support members
25 approximately parallel and spaced apart from each other
by approximately said seat width and suspends said sling
seat means between said seat support members.

14. A chair according to claim 13, wherein each of
said stretcher members comprises:

30 a combined leg and stretcher structure comprising a
an elongated stretcher portion having approximately said
stretcher tube length and vertical leg portions attached
to opposite ends of said elongated stretcher portion.

15. A chair according to claim 13, further
35 comprising:

an elongated first back support member having a
bottom end and a top end permanently pivotably mounted

1 at said bottom end to said rear end of said connector
seat support member to pivot about a first back support
axis perpendicular to said front stretcher member axis
and perpendicular to said first seat support member;

5 an elongated second back support member having a
bottom end and a top end permanently pivotably mounted
at said bottom end to said rear end of said connector
seat support member to pivot about a second back support
axis perpendicular to said rear stretcher member axis
10 and perpendicular to said second seat support member;
and

sling backrest means for receiving and suspending
weight having first and second approximately parallel
sides attached at said first side to said first back
15 support member and attached at said second side to said
second back support member, whereby said sling backrest
means is suspended between said back support members
when said back support members are positioned
approximately parallel to each other and spaced apart by
20 approximately said seat width.

16. A chair according to claim 13, wherein said
front detachable connector means further comprises first
locking means for locking said connector end of said
front stretcher member to said front end of said
25 receiver seat support member when they are connected;
and

wherein said rear detachable connector means further
comprises second locking means for locking said
connector end of said rear stretcher member to said rear
30 end of said first receiver seat support member when they
are connected.

17. A chair according to claim 13, wherein said
seat support members and said backrest support member
comprise hollow tubes.

35 18. A chair according to claim 13, wherein said
stretcher members comprise hollow tubes.

1 19. A chair according to claim 13, wherein said
stretcher member length is approximately equal to said
seat width.

5 20. A collapsible chair that can be expanded for
use without assembling separate components, comprising:

an elongated connector seat support tube having a
seat support length, a front end and a rear end;

10 an elongated receiver seat support tube having a
length approximately equal to said seat support length,
a front end and a rear end;

15 a fabric sling seat having first and second
approximately parallel sides attached at said first side
to said connector seat support tube and attached at said
second side to said receiver seat support tube, whereby
said fabric sling seat is suspended between said seat
support tubes when said seat support tubes are
positioned approximately parallel to each other and
spaced apart by approximately a seat width;

20 an elongated front stretcher tube having a pivot end
and a connector end defining a stretcher tube length,
permanently pivotably mounted at said pivot end on the
front end of said connector seat support tube to pivot
about a front stretcher tube axis approximately
perpendicular to said connector seat support tube,
25 whereby said front stretcher tube can pivot to be
parallel to said connector seat support tube and whereby
said connector end of said front stretcher tube can
pivot to be adjacent to said front end of said receiver
seat support tube when said seat support tubes are
30 positioned approximately parallel to each other and
spaced apart by approximately said seat width;

35 an elongated rear stretcher tube having a pivot end
and a connector end spaced apart by approximately said
stretcher tube length permanently pivotably mounted at
said pivot end on the rear end of said connector seat
support tube to pivot about a rear stretcher tube axis
approximately perpendicular to said connector seat

1 support tube, whereby said rear stretcher tube can pivot
to be parallel to said connector seat support tube and
whereby said connector end of said rear stretcher tube
can pivot to be adjacent to said rear end of said
5 receiver seat support tube when said seat support tubes
are positioned approximately parallel to each other and
spaced apart by said seat width;
a front leg receiver connector having a front
receiver slot mounted on said front end of said receiver
10 seat support tube;
a front stud connector configured to be engaged in
said front receiver slot mounted on said connector end
of said front stretcher tube;
a rear leg receiver connector having a rear receiver
15 slot mounted on said rear end of said receiver seat
support tube;
a rear stud connector configured to be engaged in
said rear receiver slot mounted on said connector end of
said rear stretcher tube;
20 whereby pivoting said connector end of said front
stretcher tube adjacent to said front end of said
receiver seat support tube and pivoting said connector
end of said rear stretcher tube to said rear end of said
receiver seat support tube and engaging said front stud
25 connector in said front receiver slot and said rear stud
connector in said rear receiver slot positions said seat
support tubes approximately parallel and spaced apart
from each other by approximately said seat width and
suspends said fabric sling seat means between said seat
30 support tubes;
an elongated first back support tube having a bottom
end and a top end permanently pivotably mounted at said
bottom end to said rear end of said connector seat
support tube to pivot about a first back support axis
35 perpendicular to said front stretcher tube axis and
perpendicular to said connector seat support tube;

- 1 an elongated second back support tube having a
bottom end and a top end permanently pivotably mounted
at said bottom end to said rear end of said receiver
seat support tube to pivot about a second back support
5 axis perpendicular to said rear stretcher tube axis and
perpendicular to said receiver seat support tube; and
a fabric sling backrest having first and second
approximately parallel sides attached at said first side
to said first back support tube and attached at said
10 second side to said second back support tube, whereby
said fabric sling backrest is suspended between said
back support tubes when said back support tubes are
positioned approximately parallel to each other and
spaced apart by approximately said seat width.
- 15 21. A chair according to claim 20, wherein each of
said stretcher members comprises:
a combined leg and stretcher structure comprising a
horizontal stretcher portion having said stretcher tube
length and vertical leg portions attached to opposite
20 ends of said horizontal stretcher portion.

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1 / 4

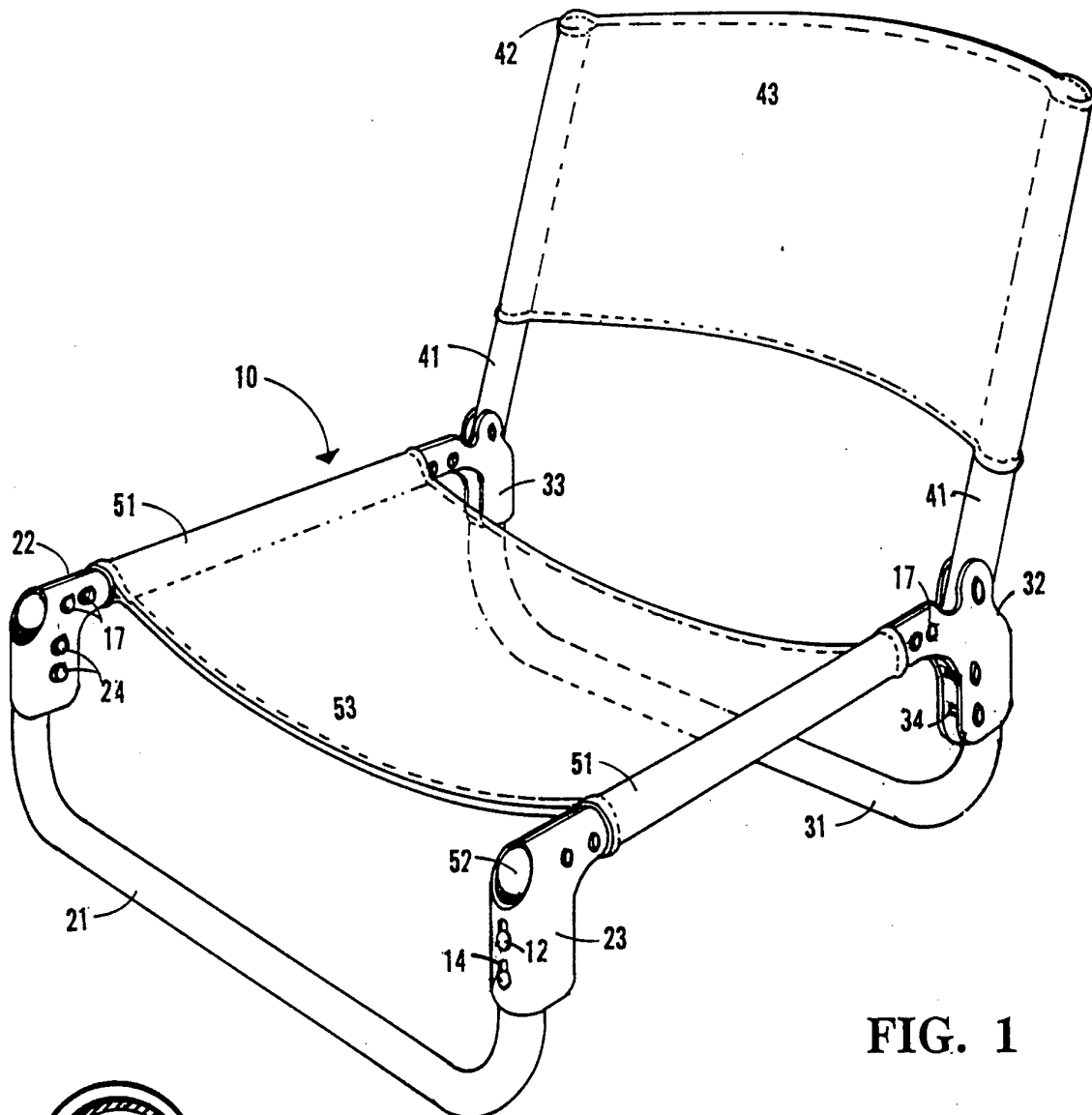


FIG. 1

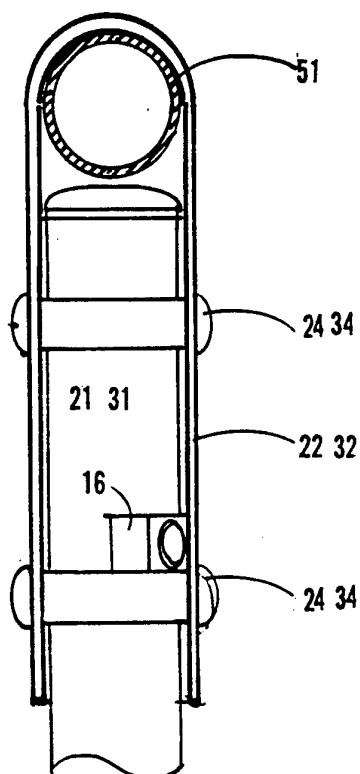


FIG. 2

3 / 4

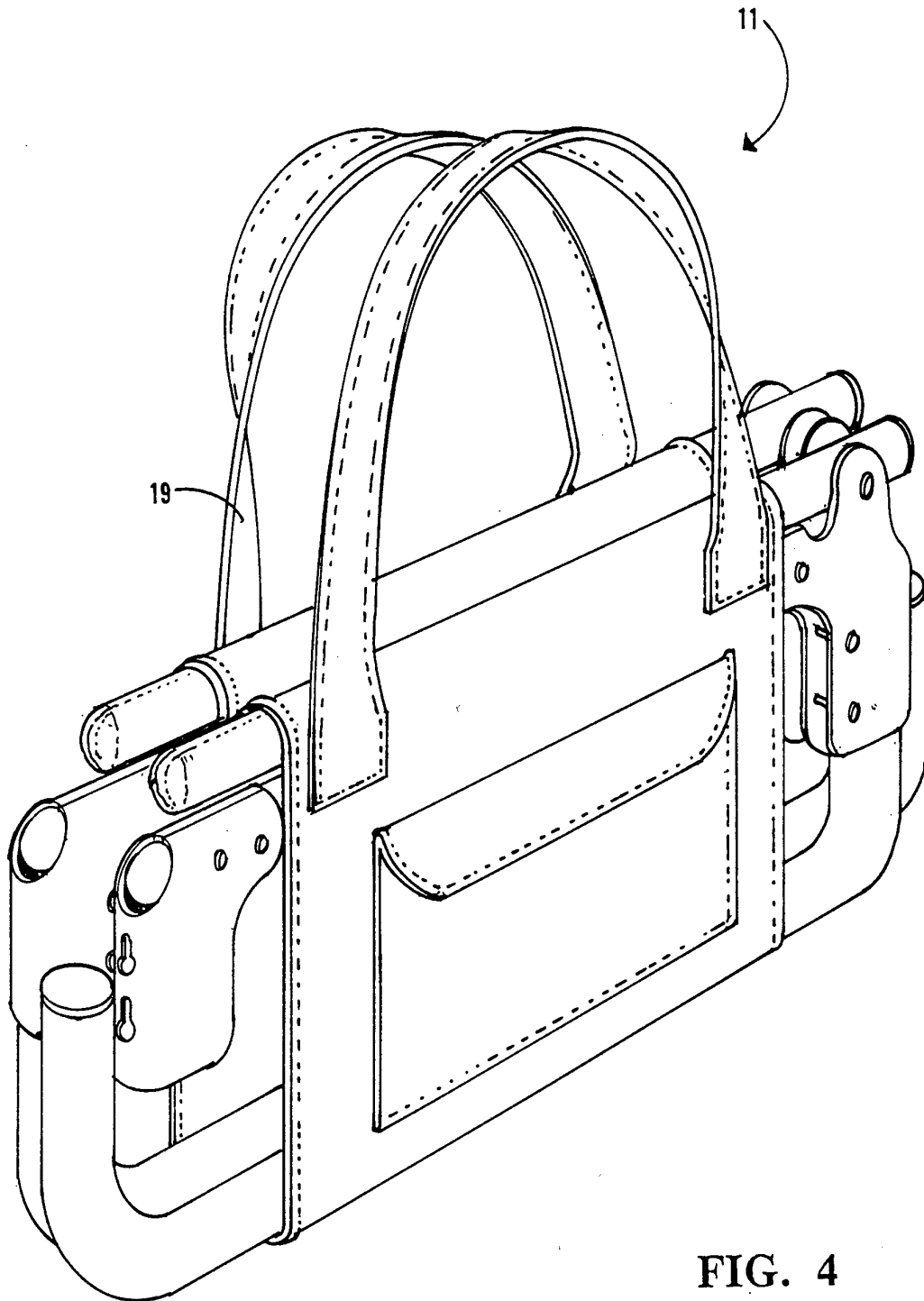
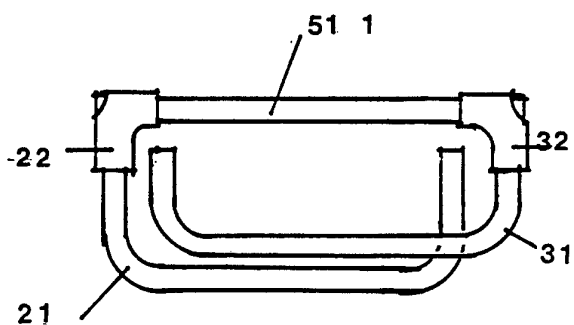
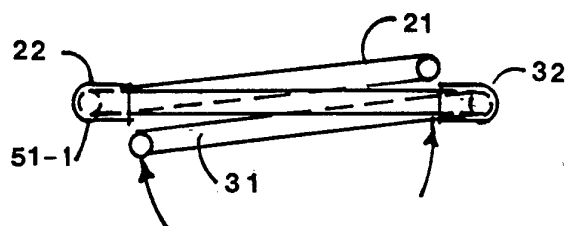
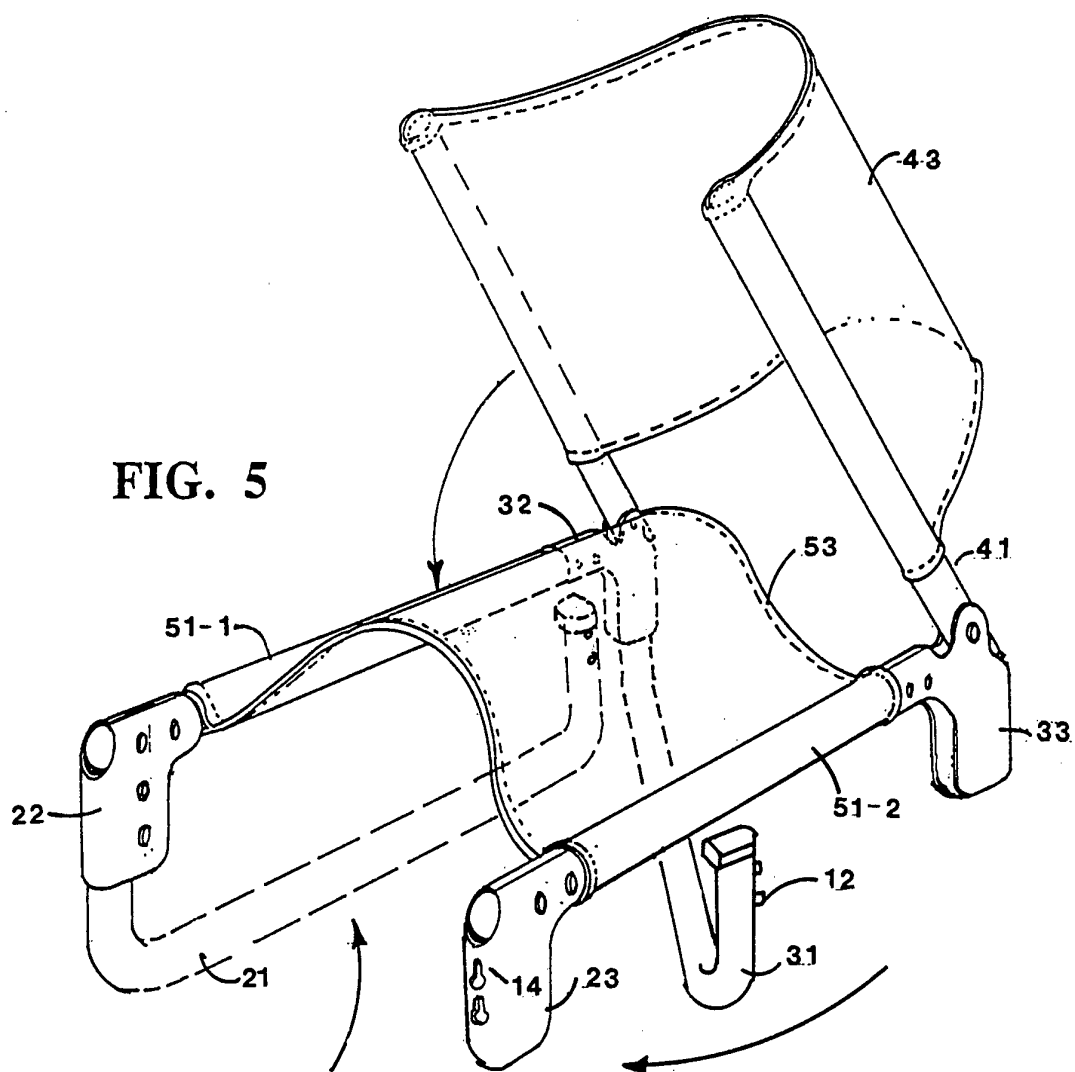


FIG. 4

4 / 4



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/04886

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) : A47C 04/28

US CL : 297/45, 54, 16.2

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 297/45, 54, 16.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A 4,784,436 (SUTHERLAND) 15 November 1988 entire document	1-21
Y	FR, A 1,135,102 (ETABLISSEMENTS PLIANFER) 10 December 1956, figures 1, 4, and 5 showing elements formed from flat stock.	1, 4, 8, 13, 16, 20
Y	FR, A 1,161,907 (TEYRAS) 31 March 1958, figures 1, 3-5 showing elements formed of flat stock material.	1, 4, 8, 13, 16, and 20
Y	FR, A 1,187,222 (LAFUMA) 02 March 1959, figures 1-4 showing elements formed of flat stock material.	1, 4, 8, 13, 16, and 20
Y	FR, A 1,245,366 (SERIEYS) 26 September 1960, figures 3-7 showing bushing means.	11

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Z* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 30 JUNE 1994	Date of mailing of the international search report JUL 13 1994
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer DAVID E. ALLRED Telephone No. (703) 308-3041

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/04886

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CA,A 673,237 (HAMILTON) 29 October 1963, figures 3-6 showing bushing means.	11
A	US, A 4,889,383 (JONES) 26 December 1989, complete document.	1-21
A	US,A 3,228,724 (RESAR) 11 January 1966, complete document.	1-21
A	US,A 5,058,949 (VON HOFFMAN) 22 October 1991, complete document.	1-21
A	IT,A 424,573 (RIGOTTI) -----, FIGURES	1-21