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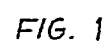
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(54) **Packing container for goods of parallelepiped configuration.**

(57) A packing container for goods of parallelepiped configuration, particularly for electric household appliances such as laundry washing machines, dishwashers and the like, is formed of at least one sheet (9) of a relatively rigid material and a plurality of protective spacers for protecting the corners and edges of the packed appliance (8). According to the invention, the sheet (9) is made of an extruded plastic material of cellular structure (14) and the protective spacers are formed integrally with the sheet in the form of bars (10, 11, 12, 13) extending over the full width of the sheet transversely of its longitudinal axis. Folding zones (29) divide the sheet into a plurality of bottom, top and sidewall panels to be folded around an appliance to be packed.

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1 Packing Container for Goods of Parallel-
 epiped Configuration

5 D e s c r i p t i o n

The present invention relates to a packing container for
goods of parallelepiped configuration, particularly elect-
ric household appliances such as laundry washing machines,
10 dishwashers and similar apparatus.

It is known that at the end of the manufacturing process
the finished electric household appliances are packed in
order to give them the necessary protection during the sub-
15 sequent storage and shipping phases.

A generally accepted packing system employs a plurality of
particularly shaped cardboard or polystyrene bodies which
are manually applied to the corners and the top and bottom
20 faces of the housing of the household appliances.

The housing of the household appliance including the man-
ually applied protective bodies are subsequently enveloped
in a cardboard casing or in a heat-shrinkable polyethylene
25 sheet.

In these systems, the packing assembly consists of a relat-
ively great number of components of different shapes and
made of different materials requiring a variety of manu-
30 facturing technologies and a great number of manual oper-
ations, particularly for singly applying the various prot-
ective bodies to the housing of the electric household app-
liance.

35 If, moreover, a heat-shrinkable sheet envelope is employed,
the packing process is undesirably delayed, as it involves
an enveloping step and the subsequent passage through an
oven for heat-shrinking the envelope about the package.

1 Also known are packing containers formed of a single pre-
folded cardboard sheet and a plurality of protective bodies
or spacers made of cardboard or polystyrene bonded to said
sheet. This type of packing container is also disadvant-
5 ageous, as it requires numerous operations for bonding or
stapling the protective spacers to the surface of the
cardboard sheet.

In addition to the above, it must not be forgotten that
10 such packing containers made of cardboard are not very stur-
dy, so that unevenly distributed loads applied to their
surfaces (for example during storage) may result in irreg-
ular and progressive deformation, leading to serious prob-
lems particularly with respect to the utilization of vert-
15 ical storage spaces. The same holds true in the case of
packing containers made of polystyrene.

It is thus evident that the degradability of the cardboard
and the heterogeneity of the packing container structure
20 limit the protection afforded to the household appliance,
particularly in the case of repeated storage and shipping
along the distribution network from the manufacturer to
the distributor and finally to the customer, and in addit-
ion exclude the possibility of the packing container being
25 re-used by the distributor or the customer.

It would therefore be desirable, and is in fact an object
of the present invention to provide a packing container
composed of the smallest possible number of parts and offer-
30 ing the greatest convenience in use so as to simplify and
rationalize the packing process.

Another object of the invention is the provision of a
packing container of the type set forth above, which is
35 of highly robust construction so as to reliably ensure the
protection of the electric household appliance during stor-
age and shipping, and to additionally include the possibil-
ity of the packing container being re-used by the distrib-

1 utor or the final customer.

These objects are attained according to the invention in a packing container for goods of parallelepiped configuration, particularly electric household appliances, comprising at least one sheet of a pre-shaped material adapted to be folded so as to envelop an electric household appliance with the interposition of angular protection elements.

10 According to the invention, a packing container of this type is characterized in that the sheet of a pre-shaped material is made of an extruded plastic material having a cellular structure, and in that the angular protection elements are integrally formed with the sheet.

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The characteristics and advantages of the invention will become more clearly evident from the following description of exemplary embodiments with reference to the accompanying drawings, wherein:

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fig. 1 shows a plan view of a packing container according to the invention,

25

fig. 2 shows a cross-sectional view of the packing container taken along the line II-II in fig. 2, showing the packing container in the act of being folded around an electric household appliance,

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fig. 3 shows an enlarged detail of fig. 2,

fig. 4a, b and c show three variations of the attachment of a closure flap of the packing container, and

35

fig. 5 shows the packing container according to the invention during the last phase of its being closed around an electric household appliance.

- 1 The description and drawings refer to a packing container 7 for an electric household appliance 8 having a square base. The packing container 7 is formed of a thermoplastic material, for instance polypropylene, which is extruded so as to form a one-piece rectangular sheet 9 the top surface of which is provided with four bars 10, 11, 12, 13 extending parallel to each other at right angles to the longitudinal axis of sheet 9 (figs. 1 and 2).
- 10 Each bar 10, 11, 12, 13 extends over the full width of sheet 9 and is of substantially L-shaped cross-sectional configuration (fig. 3). The cross-sections of the two outer bars 10 and 13 face inwards of the sheet 9, while the two inner bars 11 and 12 face outwards in opposite directions, the distance ℓ between the vertical elements of bars 10, 13 and the vertical elements of the associated bars 11, 12 corresponding to the width of respective sidewalls of household appliance 8.
- 20 In this manner, associated pairs of bars 10, 11, 12, 13 are adapted to cooperate with one another for protecting the vertical edges and the corners of appliance 8 in the closed state of the packing container.
- 25 During the extrusion step, sheet 9 with bars 10, 11, 12, 13 is cut to a length corresponding to the sum of the height of appliance 8 and the dimension of its base. Subsequently sheet 9 is subjected to a finishing operation for the formation of a closure flap 15, four top panels 21, 22, 23, 24, four bottom panels 17, 18, 19, 20 and a plurality of recessed relief zones 14 permitting the various panels to be folded inwards as the packing operation proceeds.
- 35 The bars 10, 11, 12, 13 extending over two non-adjacent bottom panels 18, 20 are formed with four recesses 16 adapted to receive the legs 30 of the appliance 8, so that in the finished packing container the full weight of the appliance is not concentrated in the area of these legs (fig. 2).

1 After the finishing operation, sheet 9 is formed with long-
itudinally and transversely extending folding lines 29
delimiting bottom panels 17, 18, 19, 20, top panels 21, 22,
23, 24 and sidewall panels 25, 26, 27, 28 of the packing
5 container.

It is to be noted that sheet 9 as well as bars 10, 11, 12,
13 are extruded so as to present a cellular structure 14
as shown in detail in fig. 3. The cellular structure 14 is
10 advantageously formed with varying dimensions for the
different portions of which sheet 9 is composed (fig. 3).
The cellular structure is intended to reduce the weight of
the packing container and to impart increased resiliency
to the contact areas between appliance 8 and the protective
15 bars 10, 11, 12, 13.

At the end of these operations, the packing container is
ready for receiving the electric household appliance 8 for
which it is suitably dimensioned. In practice, the packing
20 container 7 according to the invention may be modified for
employ with various types of electric household appliances
by merely varying the length to which sheet 9 and bars 10,
11, 12, 13 are cut, the associated pairs of bars 10, 11, 12,
13 being in any case spaced by a distance ℓ corresponding
25 to the length of the sides of the base of the respective
appliance (fig. 2).

It is to be noted that bars 10, 11, 12, 13 of the packing
container 7 according to the invention may be co-extruded
30 with the sheet 9 in such a manner that bars of different
dimensions are formed in different positions on the sheet,
it being also possible to employ materials which are struct-
urally different from those constituting the basic sheet
and more suitable for various types of appliances to be
35 packed.

As a matter of fact, the packing container according to the
invention lends itself to readily achieve a structural and

1 dimensional flexibility particularly advantageous on the
one hand for manufacturers having a specialized production,
and on the other hand, even more important, for manufactur-
ers having a diversified production.

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It is evident that these characteristics render the employ
of the packing container 7 according to the invention part-
icularly advantageous in those industrial sectors the
products of which are of the modular type, for instance in
10 the combination furniture sector.

In the initial phase of the packing process, electric house-
hold appliance 8 is laid down on the two protective bars
10, 11 of sidewall panel 25 as shown in fig. 2, whereupon
15 front panel 26 and sidewall panel 27 with the two other
protective bars 12, 13 are folded upwards and backwards
into contact with appliance 8, followed by rear panel 28
including closure flap 15 being also folded upwards.

20 Closure flap 15 may be provided with snap fastener means 31
as shown in fig. 4a. As an alternative, flap 15 may attached
to sidewall panel 27 onto which it is folded down by means
of adhesive tape oder staples as shown in figs. 4b and 4c,
respectively. At the end of these operations, the packing
25 container is in the state shown in fig. 5.

Subsequently bottom panels 18, 20 and lateral bottom panels
17, 19 are closed with the aid of adhesive tape, staples or
the like, followed by closing top panels 22, 24 and top
30 lateral panels 21, 23 in similar manner, whereupon the thus
packed electric household appliance 8 is tilted to the up-
right position in which it rests on bottom panels 18, 20,
the latter being provided with the recesses 16 for the legs
of the electric household appliance 8, so that the weight
35 thereof is evenly distributed over the protective bars of
the base panels.

1 In this manner the packing container according to the in-
vention greatly simplifies and rationalizes the packing
process, as it includes in a one-piece construction the
outer envelope as well as the protective spacers for the
5 top plane, the bottom plane and the edges and corners of the
electric household appliance 8 to be packed.

In addition, the packing container may be made of any suit-
able thermoplastic material having sufficient rigidity for
10 ensuring protection of the packaged goods during storage and
shipment from the manufacturer to the user, and capable of
being extruded with an internal structure adapted to render
more resilient the contact points with the electric household
appliance and to resiliently absorb unevenly distributed
15 loads possibly exerted on the surfaces of the packing con-
tainer during storage and shipment.

It is thus evident that the integral construction of the
described packing container greatly simplifies storage of
20 the packing container itself and a possible automatization
of the packing process.

The packing container according to the invention may of
course be modified in various manners within the scope of
25 the characteristics set forth in the claims.

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Packing Container for Goods of Parallel-
epiped Configuration

P a t e n t C l a i m s

1. A packing container for goods of parallelepiped configuration, particularly electric household appliances, comprising at least one sheet of a pre-shaped material adapted to be folded so as to envelop an electric household appliance with the interposition of angular protection elements, characterized in that said sheet (9) of a pre-shaped material is made of an extruded plastic material having a cellular structure (14), and that said angular protection elements (10, 11, 12, 13) are integrally formed with said sheet (9) on the upper surface thereof.

2. A packing container according to claim 1, characterized in that said angular protection elements are formed as

1 elongate bars (10, 11, 12, 13) extending in parallel spaced
relationship over the full width of said sheet (9) and
having an L-shaped cross-sectional configuration oriented
in such a manner that pairs of said bars (10, 11, 12, 13)
5 cooperate in the folded state to cover the corners, the
vertical edges and parts of the horizontal edges of the
electric household appliance (8).

3. A packing container according to claim 1, character-
10 ized in that said bars (10, 11, 12, 13) are formed by a
co-extrusion process on the upper surface of said sheet (9)
and in that the cells (14) constituting their structure are
variably dimensioned with respect to the structural cells
(14) of the basic sheet (9).

15

4. A packing container according to claim 1, character-
ized in that said sheet (9) is formed with recessed zones
(14) and folding zones (29) defining four bottom panels (17,
18, 19, 20), four top panels (21, 22, 23, 24) and four
20 sidewall panels (25, 26, 27, 28) adapted to be successively
closed so as to completely envelop said electric household
appliance (8).

5. A packing container according to the preceding claims,
25 characterized in that each of said bars (10, 11, 12, 13) of
two bottom panels (18, 20) is formed with a cylindrical
recess (16) adapted to receive therein a corresponding
support leg (30) of said electric household appliance (8)
in the folded state.

30

6. A packing container according to the preceding claims,
characterized in that a closure sidewall panel (28) of said
packing container is provided with a flap (15) adapted to
be secured by means of a snap fastener device (31) to the
35 surface of the sidewall panel (25) onto which it is folded
down for closing the packing container.

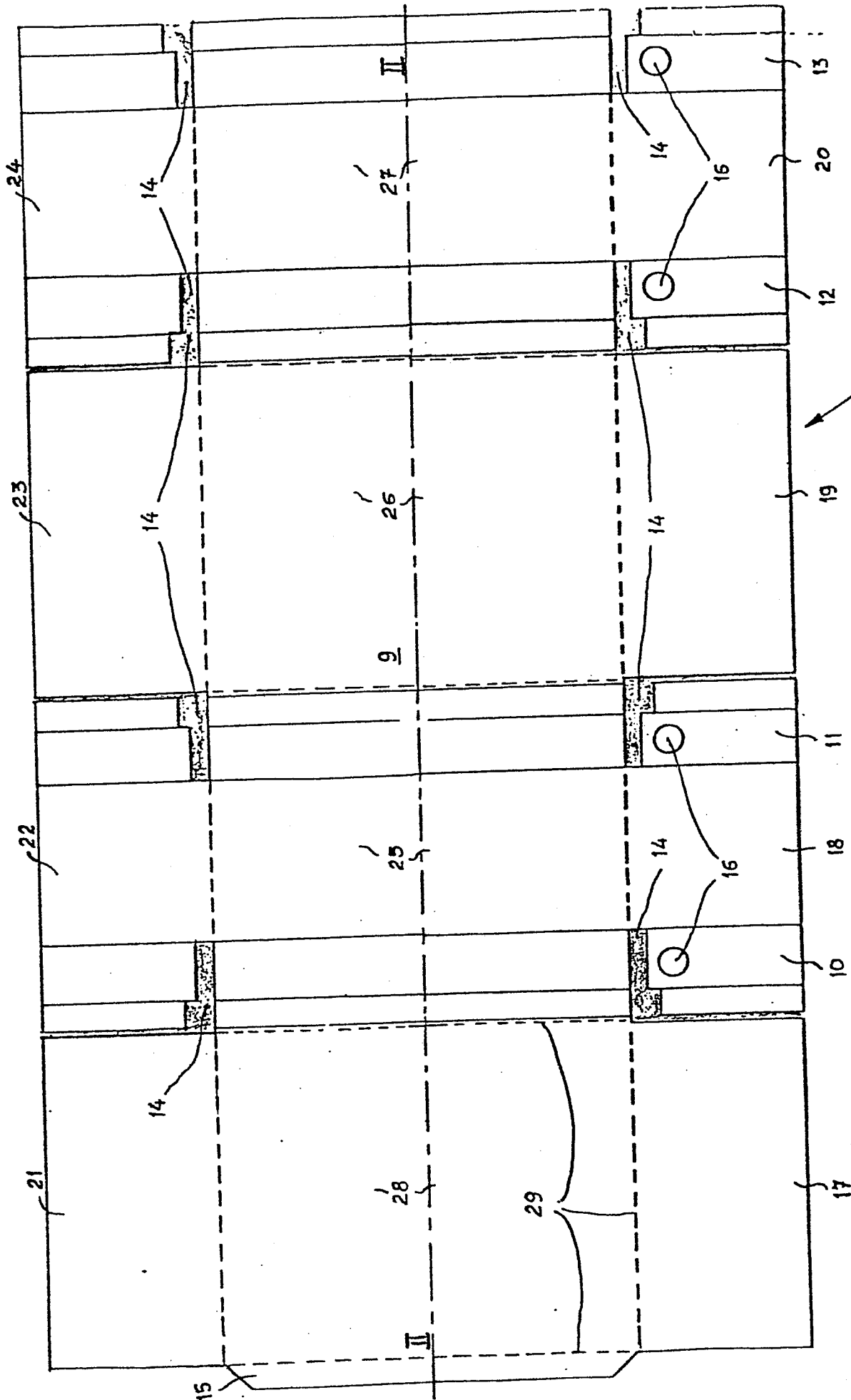


FIG. 1

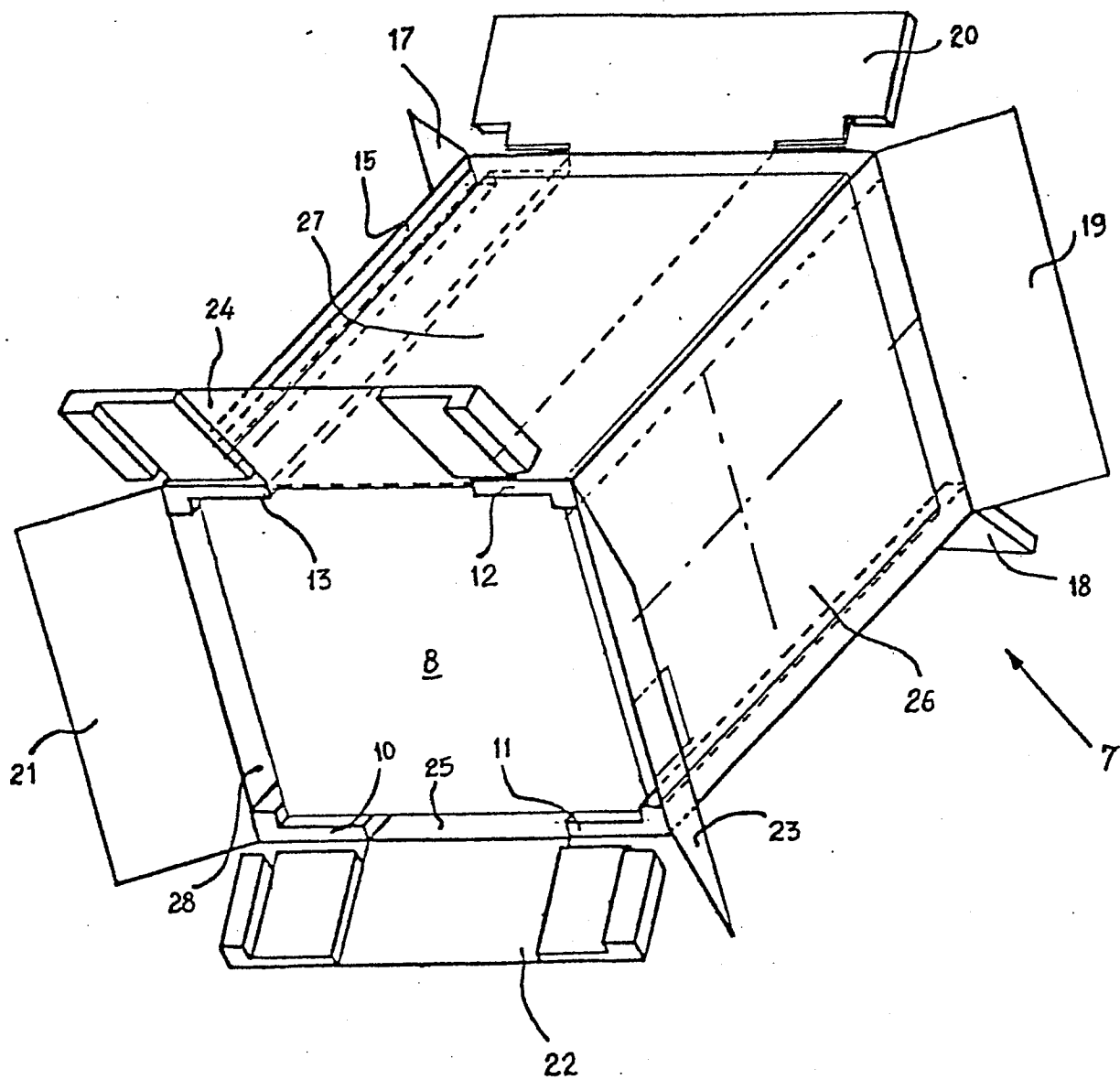


FIG. 5