

26937/88

FORM 1

601956

REGULATION 9

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

We, BERNARD MATTHEWS PLC, a British Company, of Great
Witchingham Hall, Norwich, Norfolk, England, hereby apply for the
grant of a Standard Patent for an invention entitled:-

~~EXTRUSION OF MULTIPLE EXTRUDATES HAVING COMPLIMENTARY~~
~~"IMPROVEMENTS IN THE EXTRUSION OF PLASTIC MATERIAL"~~
SHAPES

which is described in the accompanying Complete Specification.

Details of basic application:-

Number: 8730125

APPLICATION ACCEPTED AND AMENDMENTS

Country: United Kingdom

AMENDED 20-7-90

Date: 24th December, 1987

Our address for service is:

SHELSTON WATERS

55 Clarence Street

SYDNEY, N.S.W. 2000.

DATED this 15th Day of December, 1988

BERNARD MATTHEWS PLC

by

Leon K. Allen

Fellow Institute of Patent Attorneys of Australia
of SHELSTON WATERS

To: The Commissioner of Patents
WODEN A.C.T. 2606

File: D.B. B-63

Fee: \$170.00



8004279 15/12/88

COMMONWEALTH OF AUSTRALIA PATENTS ACT, 1952-1973
DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application No. made
 (a) Here Insert (in full) Name of Company, by (a) **BERNARD MATTHEWS PLC**

(hereinafter referred to as "Applicant") for a patent for an invention entitled:
 (b) Here Insert Title of Invention, (b) **"IMPROVEMENTS IN THE EXTRUSION OF PLASTIC MATERIAL"**

(c) Here Insert Full Name and Address of Company Official authorised to make declaration, (c) **JOHN GRANGER BROWN**

(d) Here Insert Full Name and Address of Company Official authorised to make declaration, (d) **BERNARD MATTHEWS PLC, a British Company of Great Witchingham Hall, Norwich, Norfolk, England**

do solemnly and sincerely declare as follows:

1. I am authorised by Applicant to make this declaration on its behalf.

2. The basic Application(s) as defined by section 141 of the Act was/were made
 (e) Here Insert Basic Country or Countries followed by date or dates of Basic Application(s), in (e) **the United Kingdom** on the **24** day of **December** 19 **87**

on the day of 19

(f) Here Insert Full Name(s) of Applicant(s) in Basic Country, by (f) **BERNARD MATTHEWS PLC**

(g) Here Insert (in full) Name and Address of actual Inventor or Inventors, 3. (g) **(See attached Schedule)**

of is/are

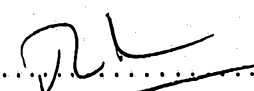
the actual Inventor(s) of the invention and the facts upon which Applicant is entitled to make the Application are as follows:

Applicant is the Assignee of the said Inventor(s).

4. The basic Application(s) referred to in paragraph 2 of this Declaration was/were the first Application(s) made in a Convention country in respect of the invention, the subject of the Application.

DECLARED at **Great Witchingham Norwich England**
 this **Sixth** day of **October** 19 **88**

(h) Personal Signature of Declarant (c) (no seal, witness or legalisation).

(h) 
 (Signature of Declarant)

(J. G. BROWN)

TO THE COMMISSIONER OF PATENTS.

SHELSTON WATERS
 PATENT ATTORNEYS
 55 CLARENCE STREET, SYDNEY
 AUSTRALIA
 Cables: 'Valid' Sydney Telex: 24422

(12) PATENT ABRIDGMENT (11) Document No. AU-B-26937/88
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 601936

(Modified Examination)

- (54) Title
EXTRUSION OF MULTIPLE EXTRUDATES HAVING COMPLIMENTARY SHAPES
- International Patent Classification(s)
(51)⁴ **A22C 011/02**
- (21) Application No. : **26937/88** (22) Application Date : **15.12.88**
- (30) Priority Data
- (31) Number (32) Date (33) Country
8730125 24.12.87 GB UNITED KINGDOM
- (43) Publication Date : **29.06.89**
- (44) Publication Date of Accepted Application : **20.09.90**
- (71) Applicant(s)
BERNARD MATTHEWS PLC
- (72) Inventor(s)
**BERNARD TREVOR MATTHEWS; DAVID JOHN JOLL; HABEEB MOHAMED ZIAUDDIN;
DAVID NORMAN WILSON**
- (74) Attorney or Agent
SHELSTON WATERS, 55 Clarence Street, SYDNEY NSW 2000
- (56) Prior Art Documents
AU 51331/90 A22C 11/02 F04B 13/00 15/02
- (57) Claim

1. A method of manufacturing shaped products, such method comprising extruding from adjacent locations at least two extrudates into fitting flexible inner casings and into an overall outer flexible casing, the nature of the extrudates and the conditions of extrusion being such that the two extrudates co-operate with one another to provide complementary predetermined shapes constrained within the outer casing.

4. A method according to claim 1 wherein the extrudates and the outer casing are extruded through a closing and sealing device and are thereafter frozen solid, the outer casing being removed and disposed of after the said freezing.

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

FORM 10
601936

COMPLETE SPECIFICATION

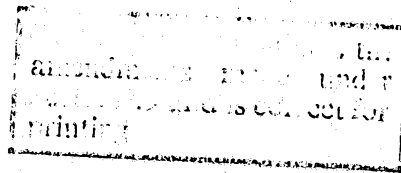
FOR OFFICE USE:

Application Number:
Lodged:

Class

Int. Class

Complete Specification Lodged:
Accepted:
Published:



Priority:

Related Art:

Name of Applicant: BERNARD MATTHEWS PLC

Address of Applicant: Great Witchingham Hall, Norwich, Norfolk,
England

Actual Inventor: Bernard Trevor Matthews, David John Joll,
Habeeb Mohamed Ziauddin and David Norman
Wilson

Address for Service: SHELSTON WATERS, 55 Clarence Street, Sydney

Complete Specification for the Invention entitled:

~~"IMPROVEMENTS IN THE EXTRUSION OF PLASTIC MATERIAL"~~

EXTRUSION OF MULTIPLE EXTRUDATES HAVING COMPLIMENTARY
SHAPES

The following statement is a full description of this invention,
including the best method of performing it known to us:-



EXTRUSION OF MULTIPLE EXTRUDATES HAVING COMPLIMENTARY SHAPES
IMPROVEMENTS IN THE EXTRUSION OF PLASTIC MATERIAL

DESCRIPTION

5 This invention relates to the extrusion of plastic (deformable) material and to the production of products of predetermined shapes by extrusion.

10 In accordance with the present invention there is provided a method of manufacturing shaped products from meat or other plastic material, such method comprising extruding from adjacent locations at least two extrudates into fitting inner casings and into an overall outer casing, the nature of the material and the conditions of extrusion being such
15 that the two extrudates co-operate with one another to provide complementary predetermined shapes constrained within the outer casing.

20 The invention is based on the appreciation that a shape extruded under pressure into a casing will tend to adopt the circular cross section. By extruding from adjacent heads two or more cased shapes into an outer casing the composite of the shapes will tend to adopt the circular cross section within
25 the outer casing but the individual shapes can be made



to co-operate with one another so as to achieve stable non-circular profiles within the outer casing. Thus extrusion heads which together make up a substantial circle can be employed and we describe hereinafter a method wherein generally D-shaped heads, back-to-back, develop an overall cylindrical configuration within an outer casing.

However, the shaping can be achieved by interaction of the coextrudates under pressure rather than by the shape of the heads and combinations of head shaping and mutual interaction are envisaged.

The invention has particular though not exclusive application to the production of products from whole-muscle meat with the muscle scaffold network intact. The extrusion of such products as explained in our EPAs 0,024,790 and 0,153,024 presents particular problems. Not only does the pressure of extrusion influence the shape of the extrudate but the whole-muscle pieces compressed during the extrusion have inherent energy which makes the extrudate difficult to control.

The invention will now be described by way of example and with reference to the accompanying drawings wherein:-

5 Figure 1 is a perspective view, partly diagrammatic, of apparatus and materials prepared for carrying out the method in accordance with the present invention;

10 Figure 2 is an enlarged view looking in the direction A of Figure 1;

 Figures 3 to 5 are perspective views illustrating stages in carrying out a method in
15 accordance with the present invention;

 Figure 6 is a section view through an assembly of extrudates produced in accordance with the invention; and

20 Figure 7 is a view of the ultimate products of the present invention.

Referring initially to Figures 1 and 2 twin hoppers 1 are each loaded with whole-muscle meat M, usually lightly prepared by a massage with salt to release binding protein.

5

Each hopper 1 is associated with a housing 2 containing a vane pump for discharging the meat through pipes 3 into and through side by side extrusion mandrels 4 and 4'. The mandrels 4 are supported on structure diagrammatically represented at 5. Thus far the apparatus is similar to that described in EPA 0,024,790. In the method being described each mandrel 4 defines a single passage of circular cross section for whole-muscle meat but the invention contemplates processes wherein each mandrel and its associated head provides a coextrusion of meat with a surrounding layer, partial or complete, of for example fatty material. EPA 0,024,790 describes a coextrusion mandrel.

20

Returning to Figure 1 of the drawings, each cylindrical mandrel 4 carries an extrusion head 6, 6' of generally D-shape. The heads 6, 6' are disposed back to back with the flat diametric faces closely adjacent so that the extrudates on emergence

25

come into contact and co-operate in the manner to be described.

5 Threaded on to each mandrel and head is a fitting or casing sleeve 7, 7' of flexible non-toxic plastic material. Over the two adjacent heads 6 and the inner casings 7 is threaded an outer sleeve or casing 8 of any appropriate flexible plastic material capable of carrying out and surviving the extrusion
10 process and subsequent freezing. Thus it can be seen that with the D-shaped heads adjacent and back to back the outside configuration taken up by the outer casing is generally circular.

15 Referring now to Figures 3 to 5 of the drawings the extrusion process in accordance with the invention is illustrated in operation. The apparatus involved comprises a first short track 18 of laterally extending rollers 9 incorporating a closure, generally
20 guillotine-like, device 10. This closure device comprises a vertically reciprocating recessed blunt blade 11 and a lower fixed recessed anvil 12 with appropriate operating means 13 to reciprocate the blade 11. The precise nature and operation of the
25 closure devices is not fundamental to the invention as

will be explained. Beyond the roller track 18 is an elongate belt conveyor 14 extending alongside a brine freezer 15. Means are provided for tipping the conveyor belt laterally to deposit articles carried thereby into the brine freezer 15 and these may be as described in EPA 0,024,790.

Referring now specifically to Figure 3 the ends of the inner casings 7, 7' and the outer casing 8 are pulled forwardly and secured closed by tie 16. Extrusion then commences (see Figure 4) and the side-by-side cased extrudates E, E' within outer casing 8 advance forwardly over the track 18 through the gate 17 defined between shaped blade 11 and shaped anvil 12 and onto the advancing belt conveyor 14. The whole-muscle meat pumped under pressure into the individual casings 7 and constrained within the outer casing 8 strives to expand to the circular and, as can be seen in Figure 6, a dynamic equilibrium assembly of two generally congruent and hemicylindrical cased extrudates E, E' in contact with one another is contained within the outer casing 8 during the process illustrated. It should be mentioned that if the delivery of the two extrusion pumps is not matched one extrudate will be larger than the other and the shapes

developed could be different. In certain circumstances this may be desirable but for the present embodiment it is desired to produce substantially identical side by side D-shaped extrudates.

5

The extrusion continues until a desired length has been achieved as shown in Figure 5 and the closure blade 11 lowered to seal the rear of the elongate extrudate assembly. This closure does not
10 sever the casings but forms a multiple closure of casing ends 7, 7' and 8 about which a tie 16 can be secured to close and seal the front end of the multiple extrudate. The casings are then cut and a front tie effected as shown in Figure 3 and the
15 process repeated to produce another extrudate assembly in the form of an elongate log.

It should be understood that this semi-automatic closure procedure can be replaced by a
20 single clipping procedure as described and illustrated in EPA 0,024,790. The closure apparatus herein described could be replaced by the closing, cutting and clipping mechanism capable in one stroke of closing the rear end of one coextrudate log and the

front end of the log to be extruded immediately behind.

5 The log clipped at both ends is then deposited sidewardly into the brine freezer 15, the outer casing 8 protecting the products against the calcium chloride refrigerant in that freezer. The product is then solidified into the state shown in Figure 6. After freezing solid in the freezer the
10 outer casing 8 is stripped off and disposed of having served the dual function firstly of enabling the desired shaped extrudate to be produced and secondly of having protected the extrudate from the brine in the freezer. The product of the invention as shown in
15 Figure 7 comprise a body of whole-muscle meat and a casing 7, which casing may remain on the product during cooking.

20 The unfrozen extrudate or log is a food product in its own right and may be chilled, cooked, cured or otherwise treated.

25 The above described extrusion system producing two D-shaped profiles is but an example of one possible system in accordance with the invention.

As a further example two generally circular extrusion heads side-by-side each dispensing a cased billet can have surrounding them an outer casing which takes up an elongate configuration with rounded ends. A stable system is developed on coextrusion though some flattening at the interfaces of the cylindrical extrudates takes place. Three generally circular heads disposed as a triad can again be encased to produce generally triangular extrudates. In principle the extrusions within the system can be shaped by the extrusion heads and/or by mutual interaction after extrusion within the outer casing. The latter shaping can be determined by the dimensions of the outer casing. Thus by calculation of relevant circumferences and experimental observations useful extruded shapes can be developed and extruded as a group.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A method of manufacturing shaped products, such method comprising extruding from adjacent locations at least two extrudates into fitting flexible inner casings and into an overall outer flexible casing, the nature of the extrudates and the conditions of extrusion being such that the two extrudates co-operate with one another to provide complementary predetermined shapes constrained within the outer casing.
2. A method according to claim 1 wherein each extrudate is shaped by the extrusion head into the predetermined shape.
3. A method according to claim 2 wherein the extrusion takes place from two D-shaped extrusion heads disposed back to back and the outer casing takes up a generally circular cross section during the coextrusion.
4. A method according to claim 1 wherein the extrudates and the outer casing are extruded through a closing and sealing device and are thereafter frozen solid, the outer casing being removed and disposed of after the said freezing.
5. A method according to claim 1 wherein the extrudates comprise whole-muscle meat.

DATED this 21st day of MAY, 1990.

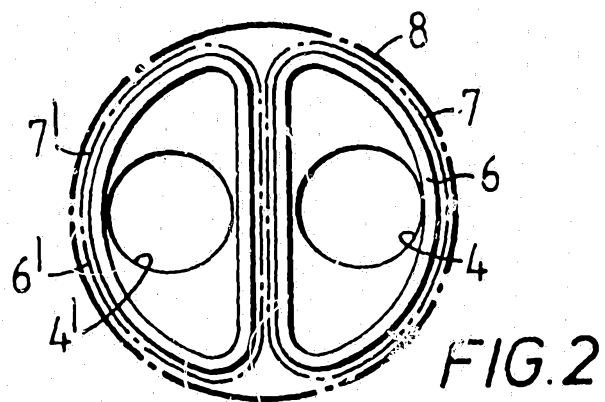
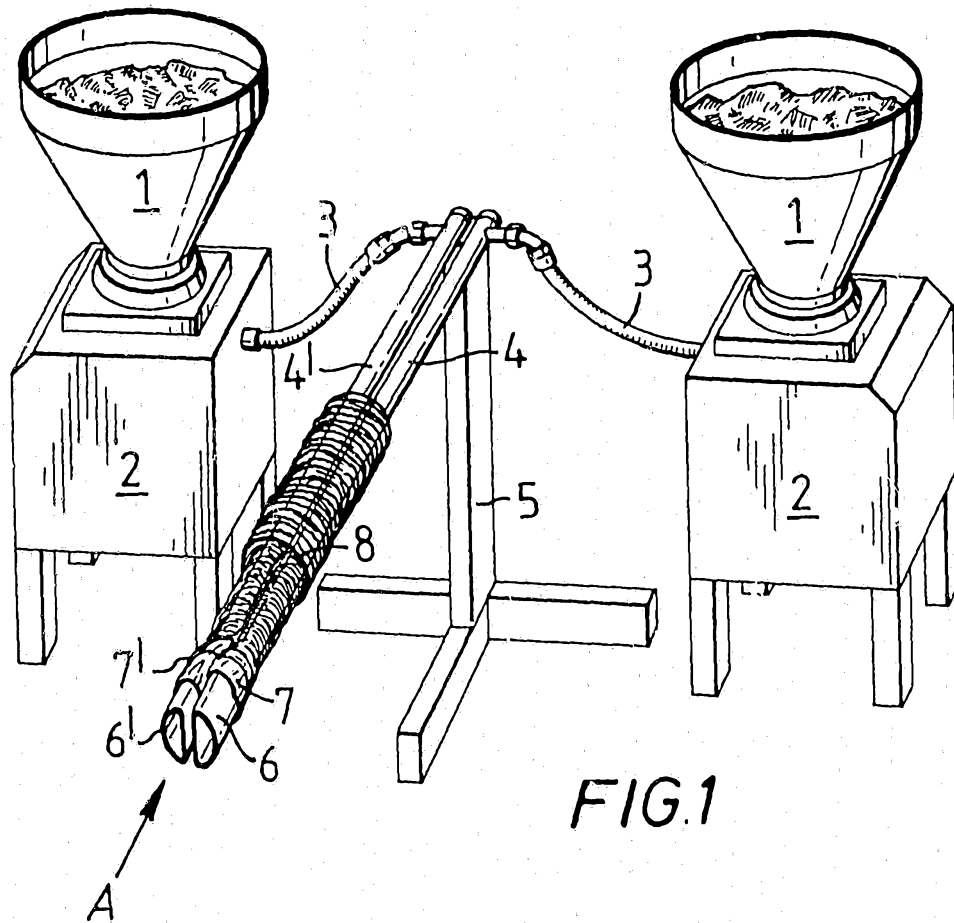
BERNARD MATTHEWS public limited company

Attorney: WILLIAM S. LLOYD

Fellow Institute of Patent Attorneys of Australia

of SHELSTON WATERS





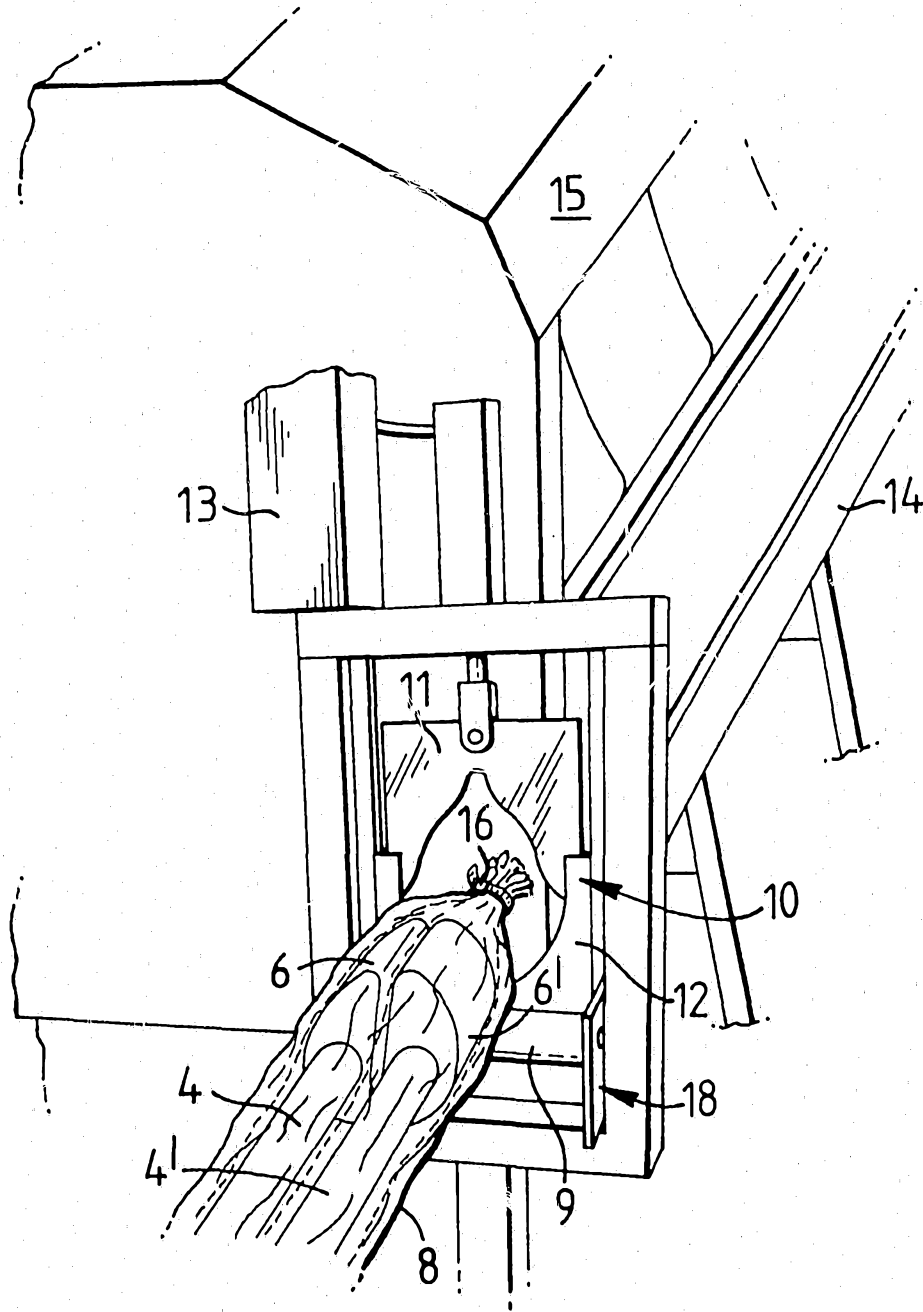


FIG. 3

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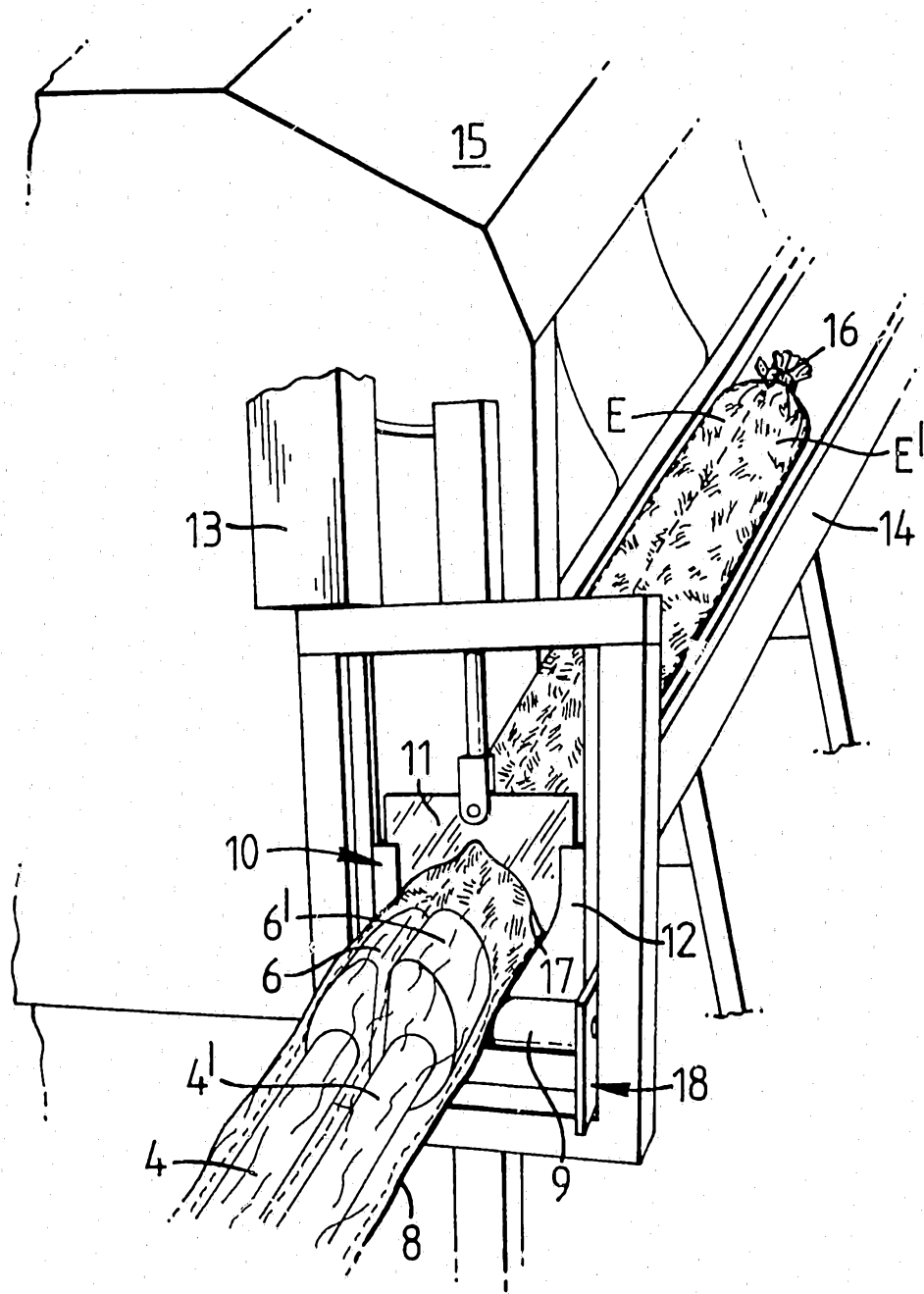


FIG. 4

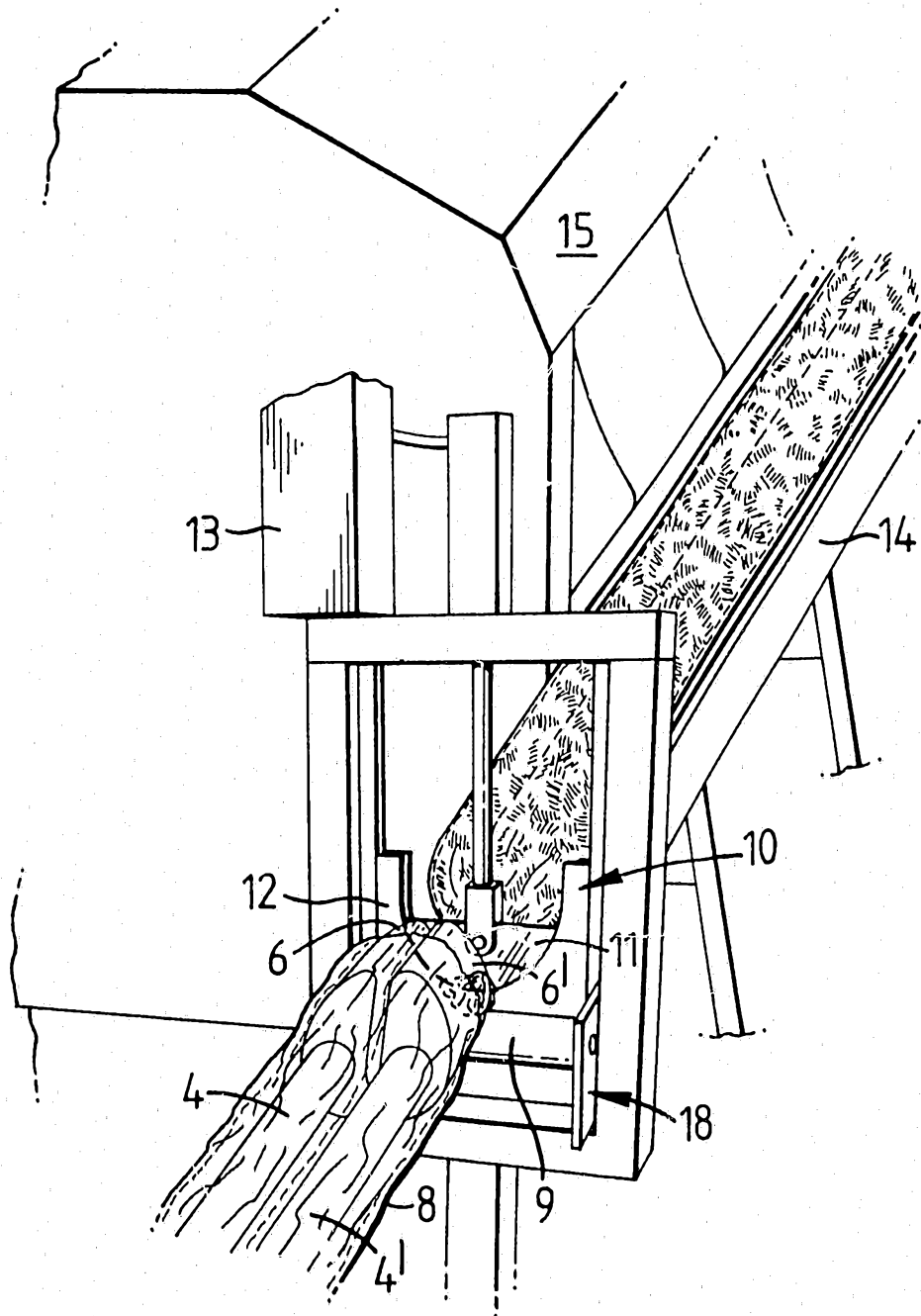


FIG. 5

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FIG. 6

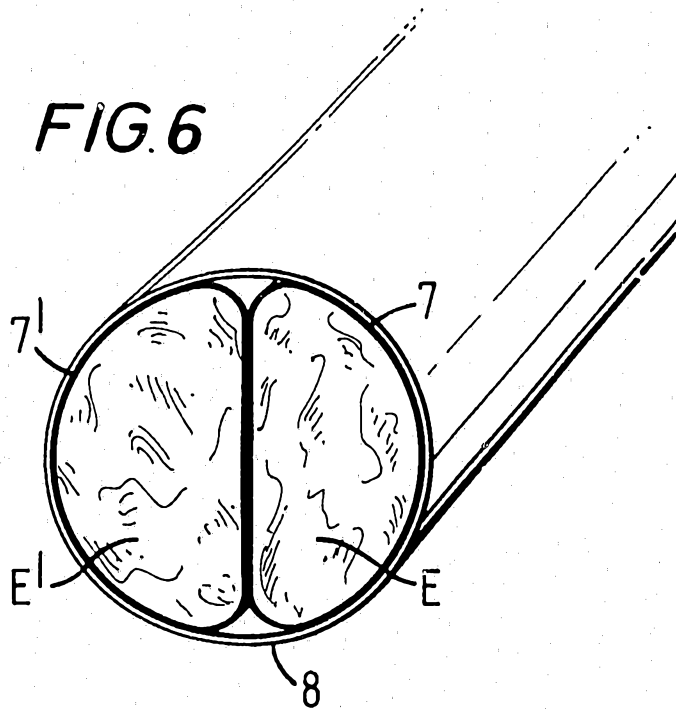


FIG. 7

