



(51) International Patent Classification:

H01B 7/00 (2006.01)

(21) International Application Number:

PCT/TR2020/050070

(22) International Filing Date:

03 February 2020 (03.02.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2019/01843

07 February 2019 (07.02.2019)

TR

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,

Published:

- without international search report and to be republished upon receipt of that report (Rule 48.2(g))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE

(54) Title: NOVELTY IN THE COATING AND PRODUCTION METHOD OF MULTI-CABLE PIPES

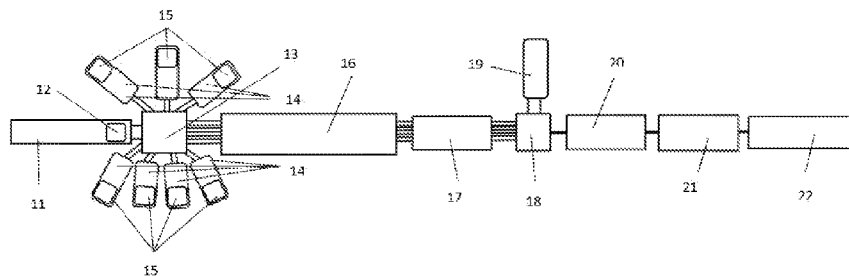


Figure – 1

(57) Abstract: The invention is related to a production method developed for producing one or a plurality of cable pipes with a single covering as a whole. The invention is particularly related to a cable channel production system which has multi-cable pipe and a cable channel having said multi-cable pipe provided by only one extruder line.



## **NOVELTY IN THE COATING AND PRODUCTION METHOD OF MULTI-CABLE PIPES**

### **Technical Field**

The invention is related to a production method developed for producing one or a plurality of cable pipes with a single covering as a whole.

The invention is particularly related to a cable channel production system which has multi-cable pipe and a cable channel having said multi-cable pipe provided by only one extruder line.

### **Prior Art**

Cable pipes from polymer type material are used in order to enable the preservation of the fiber optic cables which are multi-cables. The cable pipes are coated after fiber optic cables are passed through thereof and are ready for use.

In the well-known applications of the art, it is obtained by means of wrapping cable pipes obtained by means of extruding thereof from polymer in the multi-extruder line to separate bobbins and coating the cable pipes in each bobbin separately. Each bobbin is required to be renewed when the bobbins are finished, and this condition leads to wastage in the bobbins. This situation makes it necessary to work with inventory. Thus, this situation makes the production difficult and increases the production costs.

In the state of the art, in the production method of the cable channel having multi-cables requires producing many cables, a plurality of extruder line, operator for each extruder line. As a result of this, source management, human mistakes and labor costs increase.

Again, in a production method of the state of the art, since a plurality of extruder lines are used, higher energy consumption occurs and while it influences the energy efficiency in a negative manner, it also increases the costs.

In the state of the art, although the cable channel wherein the fiber optic cables are placed is produced transparently, the colorful cables therein cannot be seen from outside in a clear manner. This situation creates ambiguity for the user since when the final use looks from outside, it is not clear which cable colors are included and how many cables are there.

The inventive novelty in the coating and production method of the multi-cable pipes is a method which is developed for eliminating the disadvantages and difficulties known in the relevant art, is durable and has high reliability.

### **Aim of the Invention**

The invention is related to a cable pipe obtained by means of coating the multi-cable pipe obtained from a single extruder line in contrast to the state of the art in a manner such that it would enable the usage of the fiber optic cables by means of protection.

The main aim of the invention is to produce simultaneously multi-pipes and pipe channel in which the multi-pipes are preserved by means of using a single extruder line.

Another aim of the invention is to facilitate finding the cable required by the user by means of drawing colorful lines on the cable channel in which the fiber optic cables are placed according to the colors of the cables therein.

Another aim of the invention is to eliminate the wastage during production. As a result of the simplicity provided in the production, saving is achieved from the energy and consumables. At the same time, since production is enabled through a single extruder line, saving is achieved from the electric energy and a reduction is made in the labor costs. Also, a production method enabling area-saving within the production area and storage area can be provided.

**Detailed Description of the Invention**

The novelty in the production method of the multi-cable pipes realized for fulfilling the abovementioned aims of the invention is shown in the attached figures.

In which;

**Figure – 1** is the drawing of the inventive production line

**Figure – 2** is the view of the multi-exit part of the inventive mould

In order to clarify the inventive novelty in the coating and production method of the multi-cable pipes, numbers are placed on the figures. In which;

- 11.** Extruder
- 12.** Gravimetric
- 13.** Mould
- 14.** Coax coating extruder
- 15.** Volumetric device
- 16.** Vacuum boiler
- 17.** 1<sup>st</sup> puller
- 18.** External coating mould
- 19.** External coating extruder
- 20.** 2<sup>nd</sup> puller
- 21.** Cutter
- 22.** Wrapper

The invention is a production system used in obtaining a cable channel which contains multi-cable channels; mainly it comprises a single extruder (11). Multi-cable pipe mainly consists of a main external coating and a plurality of cable pipes therein and a wire which enables traceability of the pipes throughout the coating. Cable pipes can be produced simultaneously preferably from one to seven pieces at once by means of a main extruder (11) and 7 coax coating extruders (14).

In the inventive production system, there are the following elements respectively; a single main extruder (11), a gravimetric (12) which enables dosing of the goods located on the main extruder (11), a mould (13) with one inlet and seven outlets next to said gravimetric (12), 7 coax coating extruders (14) which draw colorful lines on the pipes transmitting raw material laterally to the mould (13) or enable coloring the inner layer thereof, a volumetric device (15) which enables color dosing on the coax coating extruders (14). In front of these, there is a vacuum boiler (16), next to this a first puller (17) which extrudes pipe, a coating mould (18) next to it, a coating extruder (19) connected to the coating mould (18), next to said coating mould (18) pipe cutter (21), and next to this there is a pipe wrapper (22).

For the production of multi-pipe, first of all, plastic raw materials which are brought to proper conditions are fed to the extruder (11). The pipes are produced with standard norms by means of the gravimetric (12) located on this extruder (11). The plastic raw material entering into the extruder (11) is passed to the mould (13) by means of bringing thereof into melt form by means of the screw and the resistances within the liner. Coax extruders (14) which are connected to the mould (13) through the side arm are fed with plastic raw material and paint. Line and/or internal coating coloring is enabled by means of the volumetric devices (15) located on these coax extruders (14). Making different coloring in each cable pipe facilitates the infrastructure cable works.

The mould (13) has a single inlet and multi-outlets. The pipes exiting out of the mould (13) enter into the vacuum boiler (16), the external diameters of the cable pipes are fixed and shaped in the vacuum calibers within the vacuum boiler (16). Shaping process of the pipes is realized by applying water cooling by means of sprays while said pipes are passing through the vacuum boiler (16).

The cable pipes exiting out of the vacuum boiler (16) are directed towards the first puller (17). Subsequently, in order to protect from external factors, these multi-pipes enter into an external coating mould (18) and they are coated by means of the coating material being fed from the external coating extruder (19). The external coating mould (18) has multi-inlet but single outlet. The coated pipes are transmitted to the cutter (21) by means of the second puller (20). After they are cut

in required lengths, then wrapping process by means of a wrapper (22) is realized. The production process is terminated at this phase.

The inventive production system makes the production of a cable channel having multi-cable pipes possible by means of a single extruder (11) line. It can realize cabling process between two to seven pieces from the main extruder (11) with different colors. Accordingly, while saving is achieved in terms of energy, field of use and labor force, saving is also achieved in terms of investment and production costs.

## CLAIMS

1. A novelty in the covering and production method of multi-cable pipes, **characterized in that**, it comprises;
  - a. a main extruder (11) wherein the multi-cable pipes are extruded from polymer melt,
  - b. a gravimetric device (12) which is located on said extruder (11),
  - c. at least one mould (13) with one inlet and multiple outlets next to the extruder (11),
  - d. at least two coax coating extruders (14) which enables drawing colorful lines on the pipes which are branched on said mould according to their colors or enables coloring the internal surfaces thereof,
  - e. at least one volumetric device (15) positioned on each coax coating extruder (14)
  - f. at least one vacuum boiler (16) which is located next to the mould (13),
  - g. a first puller (17) which is connected to the outlet of said vacuum boiler (16),
  - h. at least one external coating mould (18) which is connected next to said first puller (17) and enables coating multi-pipes within a single pipe, with multiple inlets and single outlet,
  - i. an external coating extruder (19)
  - j. a second puller (20) which is connected to the outlet of said external coating mould (18),
  - k. at least one cutter (21) located next to said second puller (20) and
  - l. at least one wrapper (22) located at the outlet of said cutter (21).
2. A vacuum boiler (16) according to claim 1, **characterized in that**; it comprises a vacuum caliber which enables fixing the external diameters of the cable pipes and sprays cold water.
3. A coax coating extruder (14) according to claim 1, **characterized in that**; coax coating extruders (14) operate parallel to the number of cables to be produced and the excessive coax coating extruders (14) are no longer in use.

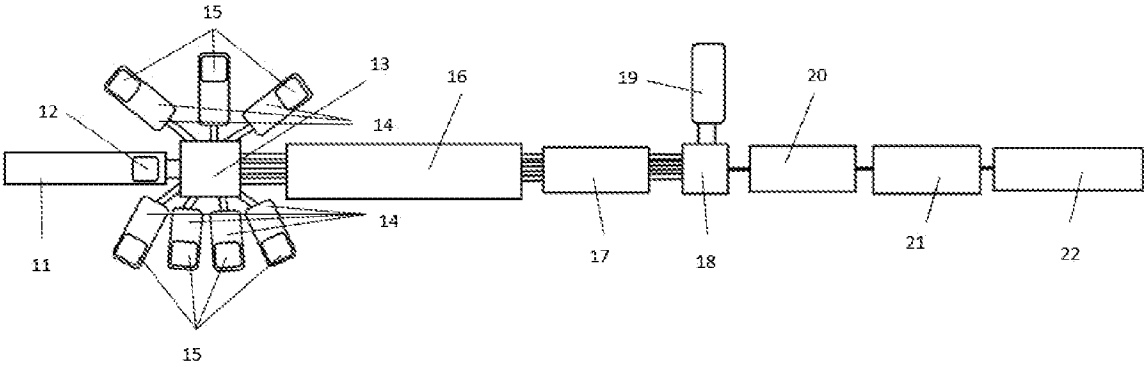


Figure – 1

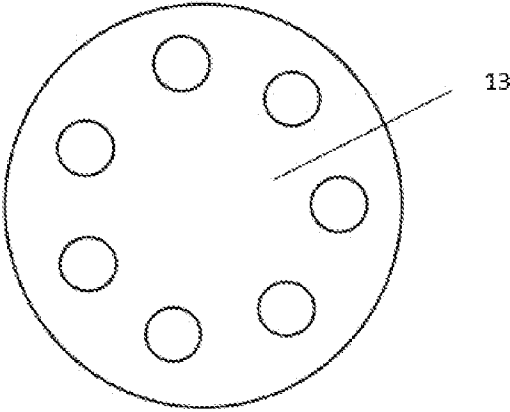


Figure – 2