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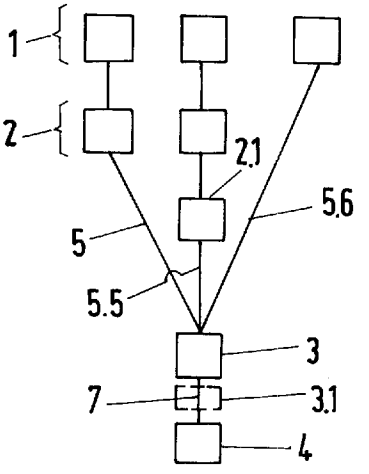
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(54) **METHODE ET APPAREIL DE PRODUCTION D'UN FIL COMPOSE D'AU MOINS DEUX ELEMENTS DE FIL**

(54) **METHOD AND APPARATUS FOR GENERATING A YARN COMPOSED OF AT LEAST TWO YARN COMPONENTS**



(57) L'invention concerne une méthode de production d'un fil composé d'au moins deux éléments de fil et porte sur un appareil permettant de produire un fil de ce type par le biais d'au moins deux étapes de traitement dont au moins une concerne la compacité. Un élément de fil est fourni sous forme de faisceau de filaments provenant d'un rouleau d'extrusion, de faisceau de filaments ou de filé provenant d'une bobine. Les étapes de traitement sont désignées par le numéro de référence (2) et l'étape de compacité, par le numéro de référence (3). Au cours de cette dernière étape, les fils individuels (5 à 5.4) sont entremêlés en un fil (7) qui est ensuite recueilli au cours

(57) The invention concerns a method for generating a yarn composed of at least two yarn components and an apparatus for generating a yarn of this type with at least two processing stages at least one of which is a compacting stage. A yarn component is supplied either as a filament bundle from an extrusion beam or as a filament bundle or as a staple fibre yarn from a package. Treating stages are designated with the reference number (2) and the compacting stage with the reference number (3) in which compacting stage the individual yarns (5 through 5.4) are compacted into a yarn (7), which subsequently is collected in a collecting

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d'une étape de cueillette, puis enroulé sur une bobine par exemple. La figure 2 diffère de la figure 1 en ce sens : un élément de fil est traité différemment, ou n'est pas traité, respectivement; par exemple le fil (5) subit le même traitement que dans la figure 1, tandis que le fil (5.5) est soumis à deux traitements et que le fil (5.6), se trouvant en amont de l'étape de compacité collective (3), n'est pas traité. Par conséquent, le caractère du fil (7.1) diffère de celui du fil (7) selon la figure 1.

stage where it is e.g. wound into a package. The Fig. 2 differs from the Fig. 1 in that one yarn component is treated differently, or is not treated, respectively, where e.g. the yarn (5) undergoes the same treatment as in the Fig. 1, whereas the yarn (5.5) is subject to two treatments and the yarn (5.6) upstream from the collective compacting stage (3) is left untreated. Correspondingly the character of the yarn (7.1) differs from the character of the yarn (7) according to the Fig. 1.

10.12.1997
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ABSTRACT

The invention concerns a method for generating a yarn composed of at least two yarn components and an apparatus for generating a yarn of this type with at least two processing stages at least one of which is a compacting stage.

A yarn component is supplied either as a filament bundle from an extrusion beam or as a filament bundle or as a staple fibre yarn from a package.

Treating stages are designated with the reference number (2) and the compacting stage with the reference number (3) in which compacting stage the individual yarns (5 through 5.4) are compacted into a yarn (7), which subsequently is collected in a collecting stage where it is e.g. wound into a package.

The Fig. 2 differs from the Fig. 1 in that one yarn component is treated differently, or is not treated, respectively, where e.g. the yarn (5) undergoes the same treatment as in the Fig. 1, whereas the yarn (5.5) is subject to two treatments and the yarn (5.6) upstream from the collective compacting stage (3) is left untreated. Correspondingly the character of the yarn (7.1) differs from the character of the yarn (7) according to the Fig. 1.

(Figures 2)

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Method and Apparatus for Generating a Yarn Composed of at Least Two Yarn Components

The present invention concerns a method for generating a yarn composed of at least two yarn components, wherein the yarn components in a last processing stage upstream from a collecting stage jointly are compacted into a yarn, and an apparatus for generating a yarn composed of at least two yarn components.

From the European Patent Application No. 0434 601 A1 a method and an apparatus are known for producing an non-twined yarn composed of at least two bundles of fibrils arranged constantly with respect to each other, in which arrangement the bundles of fibrils, called yarn components in the context of this description, each are treated separately in a processing stage each before being drawn, and after drawing are textured jointly. According to common knowledge the textured Yarn subsequently is entangled furthermore in such a manner that the bulked character of the yarn is adapted into a yarn suitable for further processing. In this arrangement the processing stage upstream from the drawing stage consists of an entangling stage, or a false-twisting stage, in which the individual fibrils of the yarn components are compacted whereby it is rendered possible to keep the distances between the individual yarn components as small as possible without inter-entangling the outermost fibrils of the individual yarn components, which can result in disturbances or at least in an intermingling of the yarn components.

From a further European Patent document EP 485 871B1 a method and an apparatus are known for generating a texturized multicoloured in which arrangement the individual colours are supplied separately from an extruder beam each and cooled, and subsequently are separately guided via an oiling device each and subsequently are guided separately through entangling nozzles each. In this arrangement the entangling process is effected in such a manner that the entanglement is dissolved in the subsequent drawing process at least to a large extent . The entanglement is aimed at compacting the individual bundles of fibrils, also called yarn components, in such a manner that the individual bundles of fib-

rils are mutually intermingled in such a manner that the colour separation in the final yarn is disturbed. The drawn bundles of fibrils subsequently are directly textured jointly, cooled and jointly are entangled in an entangling device and subsequently are wound up in a package. The last mentioned entanglement is a collective entanglement, i.e. an interconnection of the three part-threads in such a manner that an actually coherent yarn is generated which can be wound up.

From the European Patent Application No. 978 10012.1 (Publication N0. EP ... .A1) it can be seen that part-threads of different types, e.g. differently coloured or differently stainable part-threads, are supplied either from extrusion beams or from thread packages and before being drawn first are oiled each and subsequently are pre-compacted, and after the drawing stage are textured either jointly in a common texturizing device, or individually each in a texturizing device each. Downstream from the texturizing device the plug emerging from the texturizing device is cooled, which cooling can be effected, at least partially, already within the texturizing device towards the exit end of the texturizing device.

After cooling of the plug the part-threads each in an after-compacting stage preferentially are entangled and subsequently are jointly entangled again, i.e. combined, in a collective entanglement stage in such a manner that a yarn is formed from the part-threads which can be wound up.

In this arrangement various types of texturing devices as well as devices for generating a corresponding yarn are shown and described to which the present application refers to, and EP 978 10012.1 therefore is considered as an integral part of the present Patent Application.

It is the goal of the present invention to guide the individual yarn components and to treat these yarn components distinctly and pre-determinably to the stage of common compacting in order to influence the yarn character generated after the common compacting stage.

According to the present invention this goal is achieved in a method in which at

least one yarn component passes through at least one processing stage, known as such, before this yarn component passes jointly with the, further treated or untreated yarn component or comonents through a last treatment stage and subsequently are collected as a yarn in the collecting stage, whereas in the apparatus at least two treating stages are provided which can be used as desired and in which at least one compacting stage and one collecting stage for a yarn consisting of two yarn components are provided.

In this arrangement the yarn components can be freshly spun and drawn yarn components or can be drawn yarn components taken from a package. The yarn components also can have undergone already a pre-compacting process in the form of an entanglement or of a false twist process.

Furthermore the yarn components can present further and differing characteristics as to the type and/or the structure and/or the colour of the yarn components. In this context the type concerns differences in linear density (tex) or in the number of fibrils in the yarn components or in the polymer type or in the stainability or in the cross-section of the fibrils or in the additives in the fibrils and the structure as to changes, or differences respectively, in their crystalline or molecular structure.

Within the scope of the present invention there still is the possibility of combining untreated and treated yarn components in the common compacting stage in order to influence the yarn character.

Furthermore an untreated yarn component also can be understood to be a staple fibre yarn spun from man-made or from natural fibres, which upstream from the collecting stage, i.e. upstream from the winding up stage of the finished yarn, is compacted jointly with the other yarn components.

Treatment of the individual yarn component can consist of any texturing process known as such, any entangling process known as such, any false twist process known as such or any other known method, which in the yarn component effects

a type of change in structure and/or form of the individual fibrils in the yarn component.

As said yarn components, except the staple fibre yarn components mentioned, are already drawn, the individual yarn components in an immediately following inventive treatment, also called "on line" treatment, can be e.g. texturized each separately and after the texturizing process can be jointly compacted, preferentially entangled in such a manner that a yarn ready to be wound up is generated.

In this arrangement also either texturizing nozzles of the same type can be supplied with different gas pressures or at different temperatures or with different gas quantities per unit time or additionally there is the possibility to choose for at least one yarn component a different texturizing nozzle which also can be operated in the manner described above.

There also is the possibility to maintain different thread tensions, to be described in the following with reference to the Figures, in the individual yarn components upstream from and/or in the common texturizing process in order to achieve variations in the yarn character after the compacting stage.

Furthermore guidance, to be described in the following with reference to the Figures, of the individual yarn components in the compacting stage can be kept different in order to keep the influence of the compacting process onto the individual yarn components different in such a manner that an influence on the yarn after the compacting process is obtained.

In a further alternative solution at least one treated yarn component is combined in the common compacting stage with at least one untreated yarn component in order to influence the yarn character resulting after the compacting stage.

In principle it is to be noticed that the yarn components are kept separate until they reach the collective compacting stage in order to obtain as many possible influences on the finished yarn as possible; in order to either simplify the method

or to further differentiate the character, or the structure respectively, of the finished yarn, and within the method yarn components can be guided jointly through a treating stage.

The present invention thus is neither limited to the treating means mentioned nor to the compacting means mentioned, as any treating or compacting means desired can be used in the application of the inventive method.

The present invention thus is not restricted to the elements shown and described.

The present invention is briefly described in the following with reference to the Figures 1 through 20 purely schematically and in the sense of examples merely.

In the Fig. 1 the row designated 1 concerns the supply of yarn components in which each component supplied either is a yarn component supplied from an extrusion beam and drawn on-line or a drawn yarn component supplied from a package.

The reference number 2 designates a row of treating stages in which arrangement, as shown in the Fig. 1, a separate treating device each being provided for each yarn component.

A common compacting stage designated with the reference number 3, as shown in the Fig. 1, jointly treats all yarn components 5 through 5.4, which subsequently are transferred to the collecting stage 4 as a yarn 7. This collecting stage 4 represents a winding device.

As shown in the Fig. 2 the individual yarn components can pass through none or through more than one of the treating stages before the individual yarn components are combined in the compacting stage 3 into a yarn 7.1.

In this arrangement the yarn component 5 is assumed to be treated in one treating stage, the yarn component 5.5 in two treating stages and the yarn component

5.6 in none of the treating stages.

Furthermore the yarn component 5.6 can be either a multi-filament yarn or also a staple fibre yarn or any other non-multi-filament yarn type desired.

The multi-filament yarn can be a yarn already texturized or treated otherwise, or can be any other yarn presenting any yarn charcteristic which is suitable to be compacted jointly with at least one other yarn component in a compacting stage.

If, as mentioned above, in the Fig. 2 the yarn component 5.6 as an alternative is a yarn component which is not to be treated further and which can be compacted jointly with other yarn components, as a rule the yarn components 1 supplied are yarn components which under certain circumstances possibly have been pre-compacted already and as a rule are drawn but as a rule not texturized, the treating stage 2 thus being the first treating stage for yarn components of this type.

Subsequently, as shown in the Fig. 2, a further treating stage 2.1, which e.g. can be a so-called after-compacting device, can be provided for one yarn component which subsequently is combined with the two other yarn components in the collective compacting device into a yarn 7.

Furthermore there is the possibility to effect the collective compacting twice or more times, which in the Fig. 2 is indicated by the rectangle 3.1 shown with broken lines.

The same applies, where in the treating stage 2.1 an after-compacting process is effected, i.e. an after-compacting process also here can be effected twice or more times, just as it applies for the collective compacting process 3.1.

If in the treating stage 2 a texturizing process is effected, known texturizing devices or texturizing methods of any type can be used. The type of the texturizing method, and of the texturizing device respectively, is not an object of the present invention.

The same applies, if in the treating stages 2 or 2.1, or 3 or 3.1 an entangling process is effected, where known entangling devices or entangling methods of any type can be used, as the type of the entangling method, and of the entangling device respectively, is not an object of the present invention.

The same applies, if in the treating stages 2 or 2.1, or 3 or 3.1 a false twist process is effected, where known false twisting stages of any type can be used as they are not objects of the present invention.

The same applies also to the collecting stages, i.e. any type of winding devices known as such or any type of collecting stages not mentioned herein can be applied.

Also one is free to operate the treating stages mentioned above, and the collective compacting stages mentioned above respectively, differently by varying the temperature, the quantity (kg/h) and the pressure of the treating gas.

In the Fig. 3 an example is shown of an entangling nozzle which can be used in the compacting stage 3 or 3.1 respectively. This entangling nozzle corresponds to an entangling nozzle of the Heberlein Company at Wattwil, Switzerland. It is understood in this context, as mentioned earlier already, that any entangling nozzle or a false twist nozzle of any make can be considered.

In the Fig. 3 the entangling nozzle is designated with the reference number 6, the entry opening for the yarn components with the reference number 9, and the gas entering the nozzle with the reference number 8.

Seen in the yarn transporting direction the entangling nozzle is preceded by a guide ring 11 which serves as a guide element for the yarn components 5 to 5.6 which, as shown in the Fig. 4, guiding these yarn components each to a different position in the entry opening 9 of the entangling nozzle in such a manner that the yarn components 5 to 5.6 are subject to different entangling effects. Three yarn components e.g. are shown in this Fig. 4, where in principle the number of yarn

components is at least two and where, as mentioned already, any of the yarn components mentioned before can be processed.

The guide ring 11 can be shifted in its position, as indicated with the shifting devices 12, in such a manner that the position of the yarn components is changed.

Furthermore the opening 16 of the guide ring 11 can be formed circular or oval or in any other shape desired in order to obtain different positions of the yarn components in the opening 9, provided the positions of the guide rolls arranged upstream from the guide ring 11 themselves can not be changed for adapting the positions of the yarn components 5 to 5.6 in the opening 9 jointly with the guide ring 11.

The clamping rolls 14 facing the guide rolls 13, with which they form pairs of clamping rolls, indicate that in combination with a pair of take-off rolls 15 provided downstream from the entangling nozzle the tension in each yarn components 5 to 5.6 can be kept different.

In this arrangement this yarn tension in each yarn component alone or in combination with the various positions of the yarn components can serve for obtaining a different yarn character of the yarn 7.

In the Fig. 4 a top view of the entangling nozzle 6 is shown along the line I-I according to the Fig. 3.

In the Fig. 4 the yarn components 5 to 5.6 are shown as an example with 3 yarn components. The gas entry is indicated with the gas 8 as shown in connection also with entangling nozzles of the Heberlein Company mentioned above.

In the Figures 5 through 19 variations are shown of the application of the treating stages for treating of equal or differing yarn components.

The treating stages are shown described already in the European Patent Appli-

cation No. 978 10012.1 which document thus is an integral part of the present application.

In the Figures 5 through 19 the same reference signs in part are applied as in the Figures 1 and 2 which together with the Figures 3 and 4 are shown and described already in the earlier Swiss Patent Application No. CH 0441/97.

The squares designated with the reference number 1 represent yarn components supplied, the reference sign A1 in the corresponding square indicating an endless filament bundle supplied from an extrusion beam or from a package, whereas the reference A2 in the corresponding square indicates a staple fibre yarn component which can be spun from man made fibres or from natural fibres.

The squares designated with the reference number 2 concern a pre-compacting process shown and described in the above mentioned European Patent Application, whereas 2.1 represents a texturizing process stage and 2.2 represents an after-texturizing process stage, which both also are described in the above mentioned Euro-Application.

The drawing stages designated 4, between the pre-compacting process stage and the texturizing process stage, shown and described in the above mentioned European Patent Application, as well as the draw rolls designated 33, 34 and 35 in the above mentioned European Patent Application are not shown here for the sake of simplicity, where the last-mentioned rolls according to the European Patent Application are non-compulsory elements.

All processing stages, as mentioned already in the introduction to the present application, can be operated differently in order to obtain variations in the yarn character, and in the fabric produced therefrom respectively, e.g. in a carpet,

In the Fig. 5 the reference sign A1 indicates that a filament bundle from an extrusion beam is treated in a pre-compacting process stage 2 and jointly with a filament bundle A2 from a package of pre-drawn filament is compacted in the collec-

tive compacting process stage 3 and subsequently is wound up as a yarn 7 in a collecting stage, e.g. in a winding device.

Instead of a filament bundle from a package with pre-drawn synthetic filament either a man-made or a natural fibre staple yarn can be compacted jointly with the filament bundle from the extrusion beam in the collective compacting stage 3 and be wound up as a Yarn 7 in the collecting stage 4.

In principle the filament bundles always are combined into a yarn 7 in the collective compacting stage 3 upstream from the collecting stage 4, and therefore in the descriptions referring to the further Figures repetition of this function is dispensed with.

The Fig. 6 differs from the Fig. 5 in that the filament bundle A1 from the extrusion beam after passing through the pre-compacting stage 2 passes through a texturizing stage 2.1 before this filament bundle is transferred with the filament bundle or the yarn from the package A2 into the collective compacting stage 3.

In the Fig. 7 the filament bundle A1 supplird from the extrusion beam is shown, which is treated additionally, compared to the method indicated in the Fig. 6, after the texturizing stage 2.1 in the after-compacting stage 2.2, before this filament bundle is transferred with the filament bundle or with the yarn from the package A2 into the collective compacting stage 3.

In the Fig. 8 two filament bundles each supplied from an extrusion beam are shown, each of which is compacted separately in the pre-compacting stage 2, whereupon the two bundles in the collective compacting stage 3 jointly are compacted into a yarn 7.

In the Fig. 9 two filament bundles A1 supplied from an extrusion beam each are shown, of which the filament bundle shown to the left hand side, looking at the Figure, is processed through a pre-compacting stage 2 and a texturizing stage 2.1, before it is joined with the adjacent filament bundle, which merely is proces

sed through the pre-compacting stage 2, in the collective compacting stage into a yarn 7.

In the Fig. 10 the filament bundle A1 shown to the left hand side after the texturizing stage 2.1 is processed through an after-compacting stage 2.2, before it joins the filament bundle, shown to the right hand side, which was processed merely through a pre-compacting stage 2, and is compacted into a yarn 7 in the collective compacting stage 3.

In the Fig. 12 a filament bundle or a staple fibre yarn supplied from a package A2 is shown, where the staple fibre yarn can be spun from man made fibres or from natural fibres, which together with two filament bundles according to the Figures 8 or 9 or 10 or 1 is compacted into a yarn 7 in the collective compacting stage 3.

In the Fig. 13 three filament bundles A1 are shown which are supplied from an extrusion beam each, in which arrangement the filament bundle shown to the right hand side is processed alone through all treating stages before reaching the collective compacting stage, whereas the filament bundle shown to the left and the filament bundle shown in the middle jointly are processed through the after-compacting stage 2.2 and subsequently are compacted together with the filament bundle shown to the right hand side in the collective compacting stage 3 into a yarn 7.

In principle a "right hand side filament" in the context of this description is understood to be a filament bundle which, viewing the Figure, is shown to the right hand side of a corresponding middle filament bundle, or of a corresponding "left hand side filament bundle" in the corresponding Figure.

In the Fig. 14 an alternative solution, differing from the solution shown in the Fig. 13, is shown, in which a left hand side filament bundle and a middle filament bundle after the pre-compacting stage 2 jointly are texturized in the stage 2.1 and subsequently are after-compacted in the stage 2.2, whereupon together with the right hand side filament bundle, which is processed through all treating stages 2

to 2.2, they are compacted into a yarn 7 in the collective compacting stage 3.

In the Fig. 15 a combination is shown of a filament bundle A2 consisting of synthetic fibres or of natural fibres, which in the collective compacting stage 3 is collectively compacted with filament bundles according to the Fig. 13 or to the Fig. 14 into a yarn 7.

In the Fig. 16 three filament bundles A1 are shown each supplied from an extrusion beam, where the right hand side filament bundle is processed alone through all the treating stages 2 to 2.2, whereas the middle fibre bundle and the left hand side filament bundle jointly are pre-compacted in the treating stage 2, and subsequently as a jointly pre-compacted filament bundle together are texturized in the stage 2.1 and after-compacted in the stage 2.2, before this joint filament bundle is compacted into a yarn 7 in the collective compacting stage 3.

In the Fig. 17 four filament bundles A1 are shown each being supplied from an extrusion beam, in which arrangement the two right hand side filament bundles jointly are pre-compacted in the stage 2 and subsequently as a joint fibre bundle are processed through the texturizing stage 2.1 and after that through the after-compacting stage 2.2, before this joint filament bundle and the two left hand side filament bundles together are collectively compacted into a yarn 7. In this arrangement the two left hand side filament bundles each are pre-compacted separately in the stage 2 and subsequently are processed through the after-compacting stage 2.2, before this joint filament bundle and with the two left hand side filament bundles together are compacted in to a yarn 7. In this arrangement the two left hand side filament bundles each are pre-compacted separately in the stage 2 and then are jointly texturized in the stage 2.1 and jointly are after-compacted in the stage 2.2, whereupon they are, as mentioned before, as a joint filament bundle are collectively compacted with the joint right hand side filament bundle in the stage 3.

In the Fig. 18 also four filament bundles A1 are shown supplied each form an extrusion beam, where the left hand side filament bundle alone is processed

through all stages 2 to 2.2 before being compacted with a triple filament bundle combined from the three adjacent individual filament bundles in the collective compacting stage into a yarn 7. In this arrangement the triple filament bundle is composed of an individual filament bundle A1 and of a double filament bundle combined from two individual filament bundles A1, where the individual filament bundle is processed alone through the pre-compacting stage 2, the double filament bundle is processed jointly through a pre-compacting stage 2 each, and subsequently is jointly processed through the texturizing stage 2.1 and then through the after-compacting stage 2.2, and then before reaching the collective compacting stage 3 jointly is after-compacted in the stage 2.2.

In the Fig. 19 two right hand side yarns A2 are shown each supplied from a package, where one package can contain a staple fibre yarn spun from synthetic fibres and the other package A2 can contain a staple fibre yarn spun from natural fibres, or both packages can contain synthetic fibre staple yarns of different characteristics or can contain different natural fibre staple yarns. In this arrangement the collected staple yarn in a joint filament bundle together with the two filament bundles indicated in the Figures 16 or 17 or 18 in the collective compacting stage 3 is compacted into a yarn 7.

The Fig. 20 indicates primarily that a further collective compacting stage 3.1 is provided, in which the yarn components 5, 5.1 and 5.2 are compacted into a pre-yarn 7.1, which together with a further pre-yarn 7.2 combined from the yarn components 5.3 and 5.4 is compacted in the last compacting stage 3 into a yarn 7 which then is collected in the collecting stage 4, where it is e.g. wound up.

The squares shown with dashed lines merely are to be understood as an indication that e.g. the individual yarn components according to the Figures 8, 9,10 and 11 are compacted in a compacting stage 3.1 into a pre-yarn, which then according to the Fig. 12 is compacted together with the single yarn component from the stage A2 in the compacting stage 3 into the yarn 7. The same applies for the yarn components according to the Figures 13 and 14 or to the Figures 16, 17 and 18, which each are compacted in a compacting stage 3.1 into a pre-yarn 7.1, where-

upon this pre-yarn according to the Figures 12, 15 or 19 together with the single yarn component from the stage A2 according to the Figures 12 or 15, or together with the two yarn components from the two stages A2 according to the Fig. 19, are compacted into a yarn 7.

Also further additional collective compacting stages, not shown here, can be provided in such a manner that more than two pre-yarns can be generated, which together can be compacted in the last collective compacting stage into a yarn 7.

It also is feasible to combine other alternative variations, not shown here, of the pre-yarns 7.1 or 7.2 respectively. Such pre-yarns can be composed, as in the examples shown in the Figures 1 through 19, of bundles of endless filaments and of staple fibre yarns, where among the filament bundles as well as among the staple yarns various types can be combined.

In principle in the Fig. 20, as in the Figures 1 and 2, as well as 5 through 19, the treating stages are designated with the reference numbers 1, 2, 2.1, 2.2, 3 and 4 as well as the additional treating stage 3.1, which can be provided as a single or as a multiple treating stage.

Furthermore for all Figures shown, according to the European Patent Application 978 100 12.1 an oil application stage is to be provided between the stages 1 and 2 for all yarn components composed of fibril bundles. Furthermore the various treating stages can be operated according to the operation variants mentioned initially in order to additionally influence the yarn character of the finished yarn 7.

If among the pre-compacting stages 2 instead of a gas-dynamic false twist device a disc twisting device, or a friction twist device, using which pre-compacting can be effected, are applied, the variable operation parameters are variations in the rotational speeds of the disc twisting device, or variations of the surface roughness of the individual discs, or of the disc of the twisting device, or the wrapping angle of the filament bundle about the discs or the disc.

Finally the squares shown with dashed lines are indicating that further variants of combinations, which are not contained in the examples shown, are feasible within the scope of the present invention, the present invention therefore not being limited to the examples shown.

Furthermore the squares shown with dashed lines are an indication that the functions 2 to 2.2 are provided interchangeably, i.e. functions can be added or taken off in correspondence with the desired yarn character.

Patent Claims

1. Method for generating a yarn composed of at least two yarn components, in which the yarn components upstream from a collecting stage collectively are compacted in a last treating stage into a yarn,
   characterized in that
   at least one yarn component is processed in at least one preceding treating stage is treated differently or is different compared to the another yarn or other yarns.

2. Method according to the claim 1, characterized in that the treating stage is at least one of the following treating stages:
   - any texturizing stage known as such,
   - any false twist stage known as such,
   - any entangling stage known as such,
   where the false twist stage or stages and the entangling stage or stages each are compacting stages.

3. Method according to the claims 1 and 2, characterized in that for each yarn component differing or equal texturizing stages, and differing or equal entangling stages, and differing or equal entangling stages are chosen.

4. Method according to claims 1 to 3, characterized in that in the direction of yarn transport more than one compacting stages are provided consecutively.

5. Method according to the claim 1, characterized in that upstream from the last compacting treating stage (3) at least one further compacting treating stage (3.1) is provided, in which at least two yarn components jointly are compacted into a pre-yarn (7.1), where the pre-yarn (7.1) together with a further pre-yarn (7.2) is compacted in the last compacting stage (3) into the yarn (7), the pre-yarn (7.1) being composed of at least one yarn component.

6. Method according to the claim 5, characterized in that the compacting stages provided consecutively can differ in their type of action.

7. Method according to the claim 1, characterized in that each treating stage is a stage in which the yarn component undergoes a permanent change in structure and/or in shape.

8. Method according to the claim 5 or 6, characterized in that at least one yarn component in the compacting stage presents a thread tension which differs from the tension in the other yarn componentor components.

9. Method according to the claim 5 or 6, characterized in that at least one yarn component in the compacting stage is located in a position which differs the positions of the other yarn componentor components.

10. Method according to the claim 2, characterized in that the operating parameters of the treatment medium in the individual treating stages are varied in a predetermined manner in order to change the appearance of the respective yarn, and of the fabric produced therefrom respectively.

11. Method according to the claim 10, characterized in that the variation of the operating parameters concerns at least a variation of one of the following parameters of the treating medium, namely:
- the pressure (bar),
- the quantity (kg/h),
- the temperature (°C).

12. Method according to the claim 1, characterized in that the yarn components comprise at least one endless filament bundle in combination with at least one further endless filament bundle or a staple fibre yarn.

13. Apparatus for generating a yarn composed of at least two yarn components, characterized in that at least two treating stages are provided for at least one

yarn component, which alternatively can be used and that at least one of the treating stages is a compacting stage.

14. Apparatus according to the claim 13, characterized in that the treating stages at least contain one of the following treating devices:
    - any texturizing device known as such,
    - false twist device known as such,
    - any entangling device known as such.

15. Apparatus according to the claim 14, characterized in that in each treating stage the texturizing device, or the false twist device, or the entangling device respectively differ from each other.

16. Apparatus according to the claim 13, characterized in that the compacting stage is at least one of the following compacting stages:
    - any false twist device known as such,
    - any entangling device known as such.

17. Apparatus according to the claim 13, characterized in that in the compacting stage the false twist device, or the entangling device respectively, for each yarn component differs from each other.

18. Apparatus according to the claim 13, characterized in that furthermore a collecting stage is provided for taking up the finished yarn, and that the collecting stage preferentially is a winding device.

19. Apparatus according to the claim 14, characterized in that means known as such are provided for handling media, which are provided for the operation of said treating stages, in a predetermined manner.

20. Apparatus according to the claim 19, characterized in that said media are a gas and that said means are at least one of the following means, namely
    - means for adapting the pressure,

- means for adapting the quantity,
- means for adapting the temperature.

21. Apparatus according to the claim 19, characterized in that said media are mechanical compacting means, preferentially a disc twist device in which at least one of the following alternative solutions is to be provided for operating the media, or for compacting a yarn bundle at the twist device, namely
- variation of the rotational speed of the discs,
- variations of the surface roughness,
-variations of the wrapping angle of the filament bundle about the single disc.

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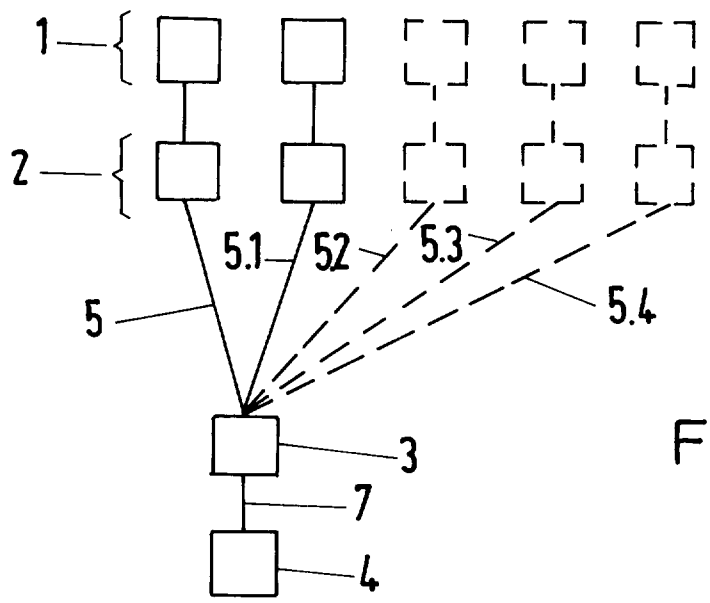


Fig.1

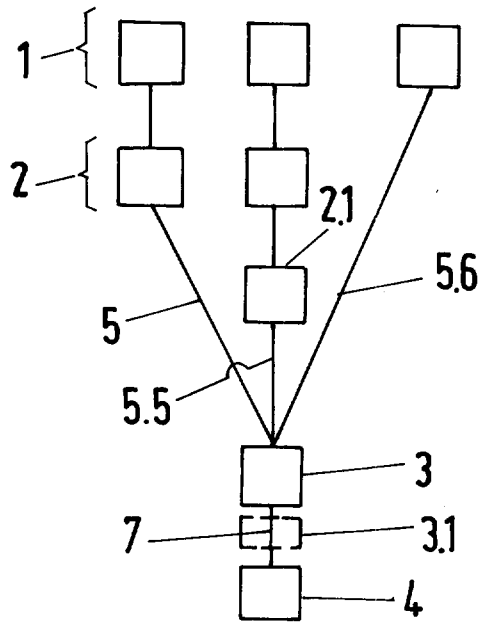


Fig.2

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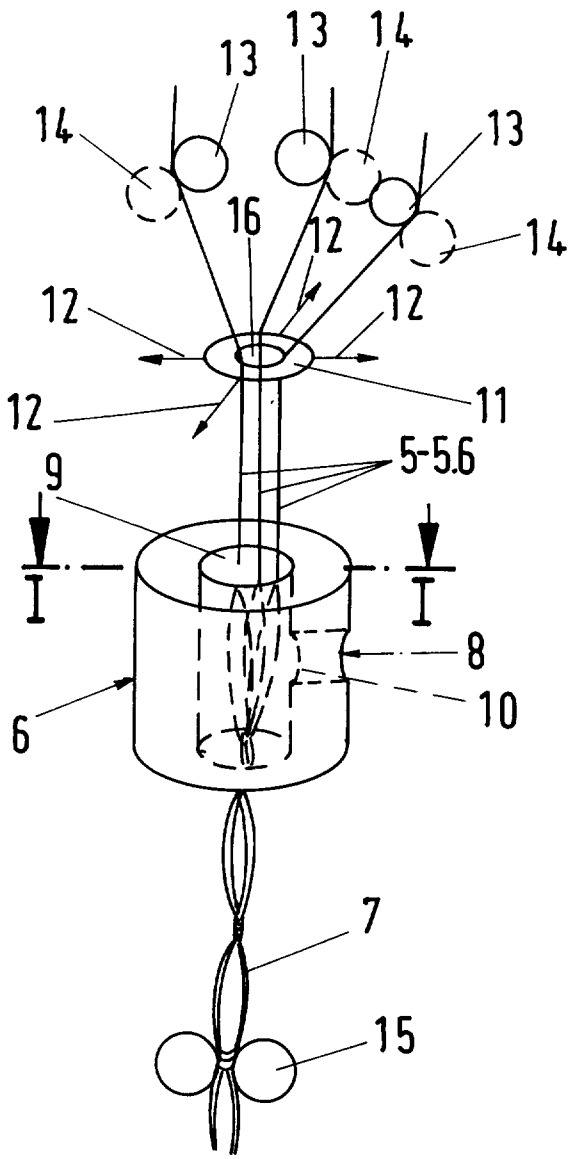


Fig.3

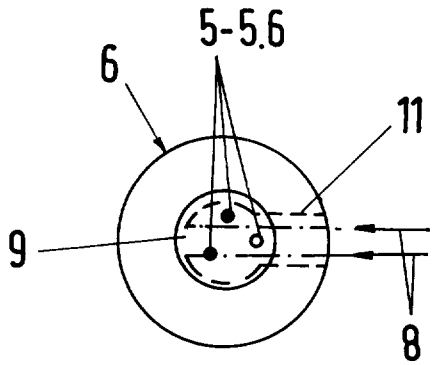


Fig.4

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Fig.5

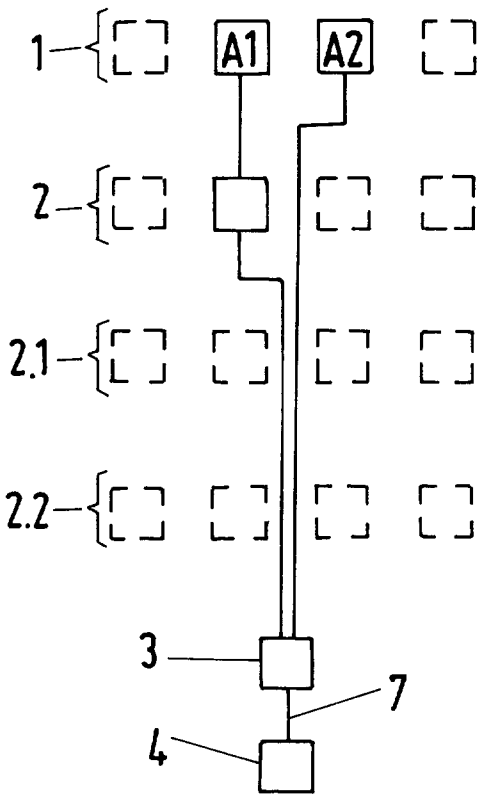
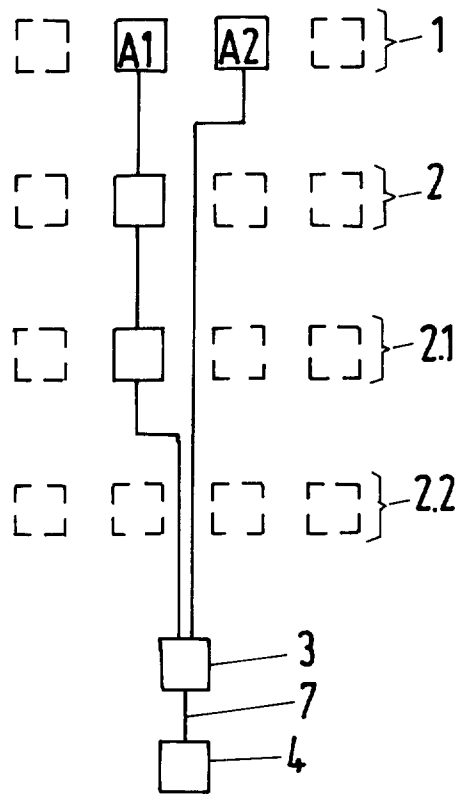


Fig.6



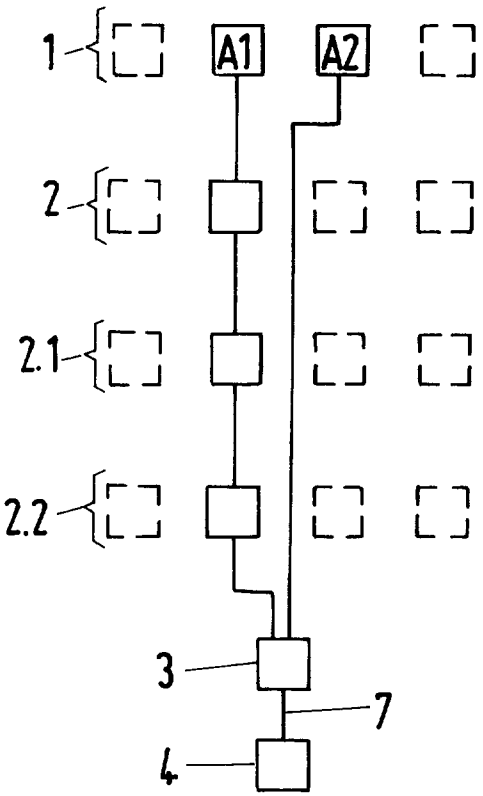


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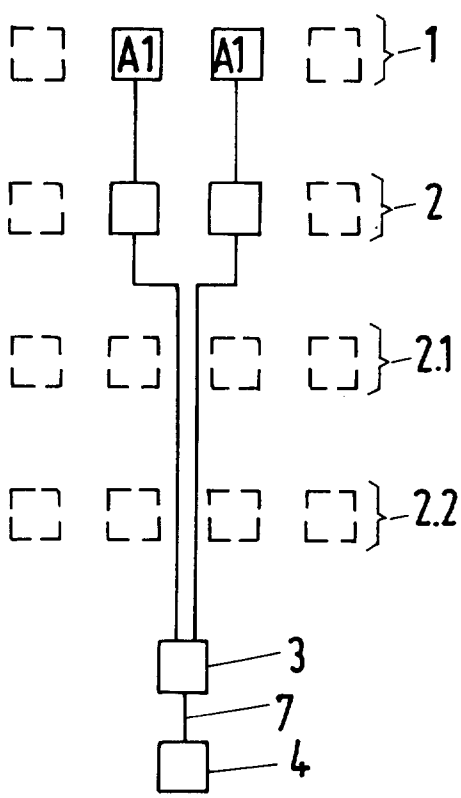


Fig.8

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Fig.9

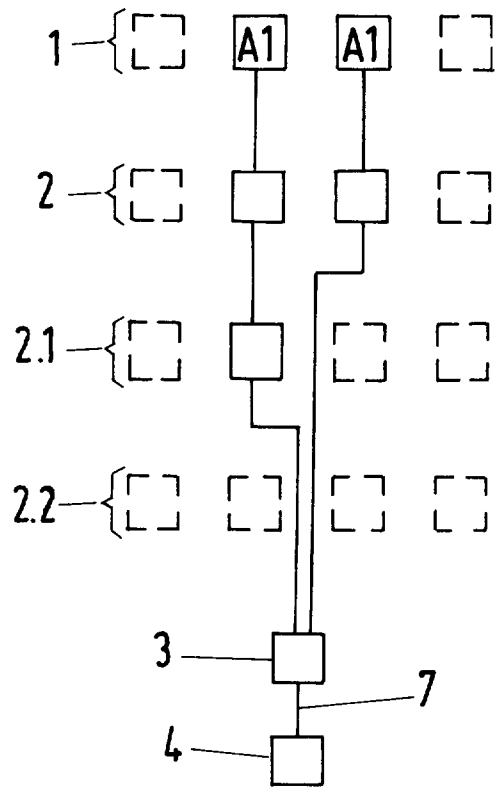
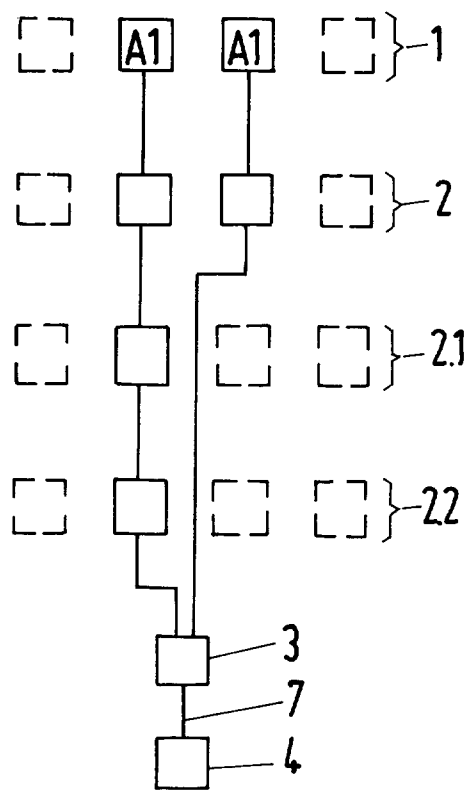


Fig.10



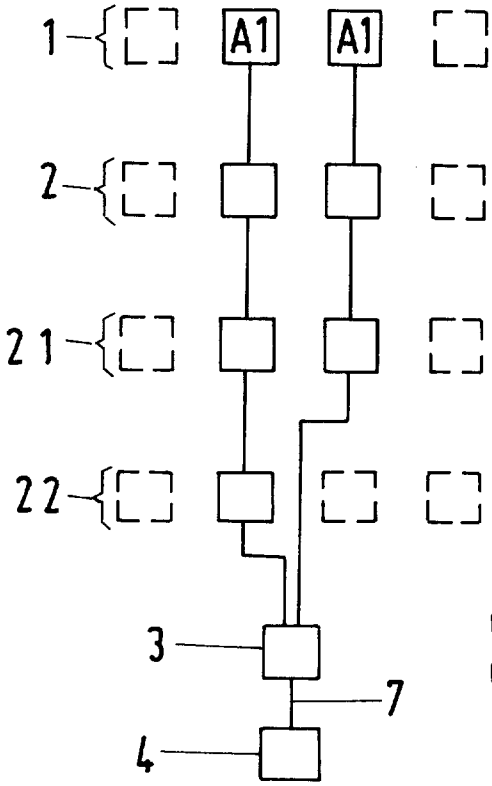


Fig.11

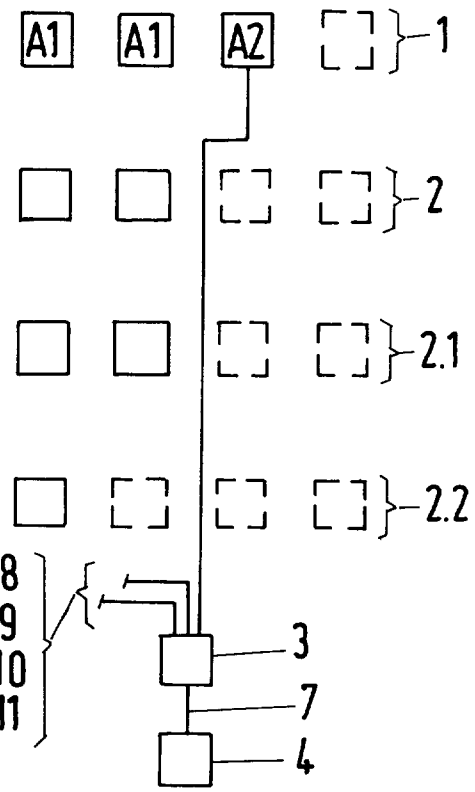


Fig.12

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Fig.13

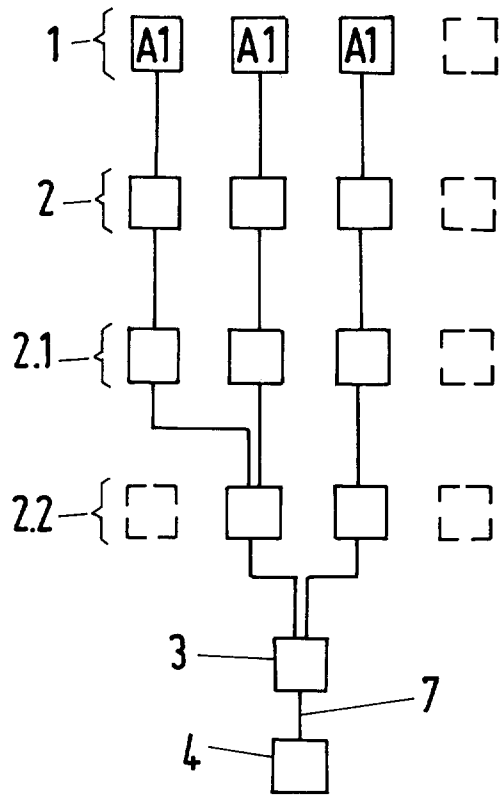
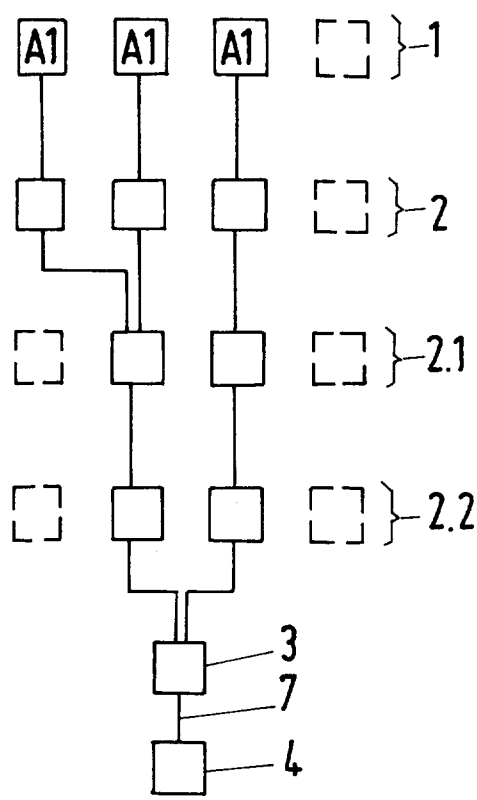


Fig.14



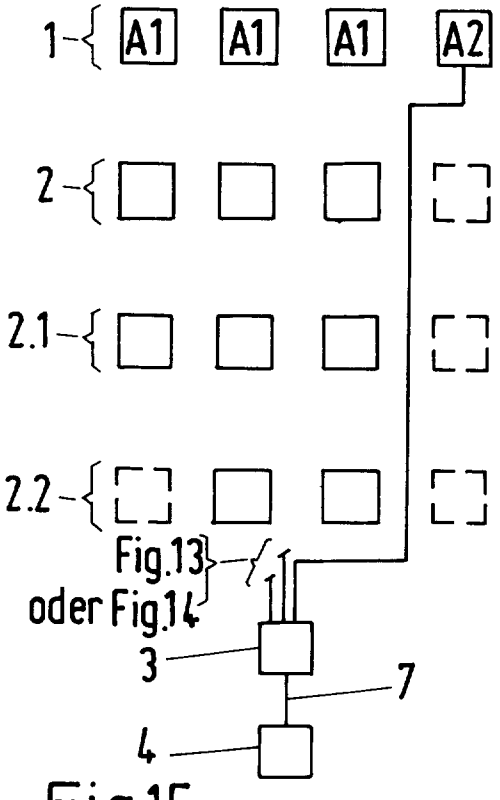


Fig.15

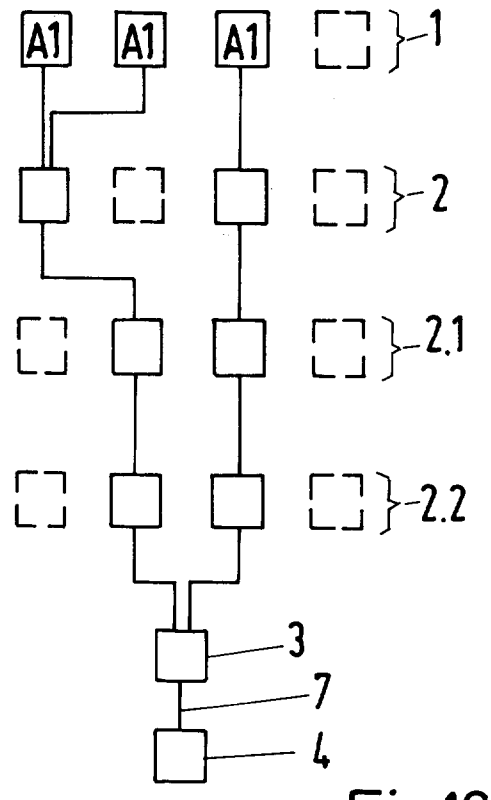


Fig.16

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Fig.17

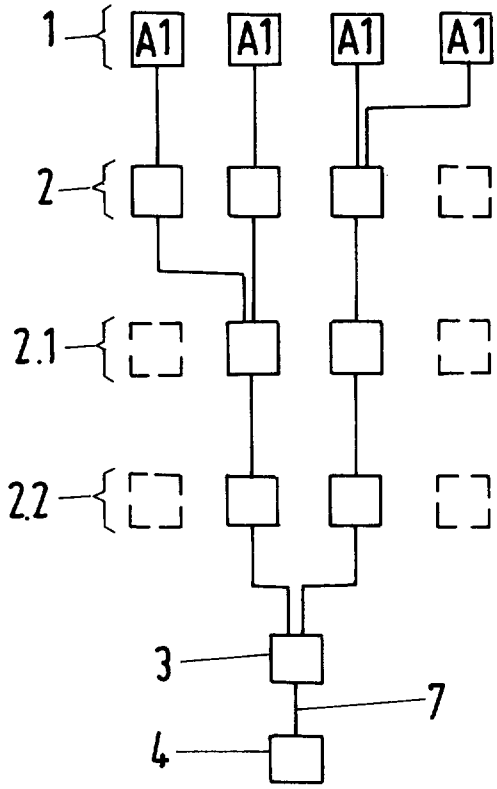
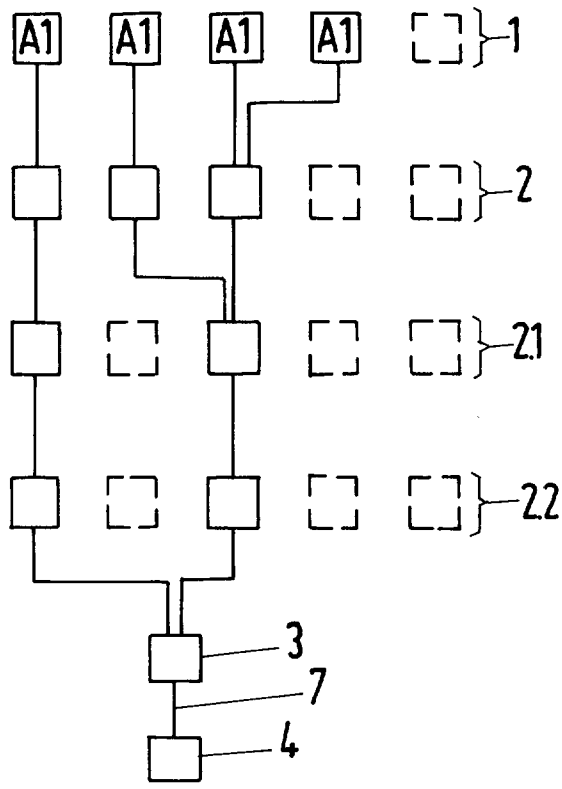


Fig.18



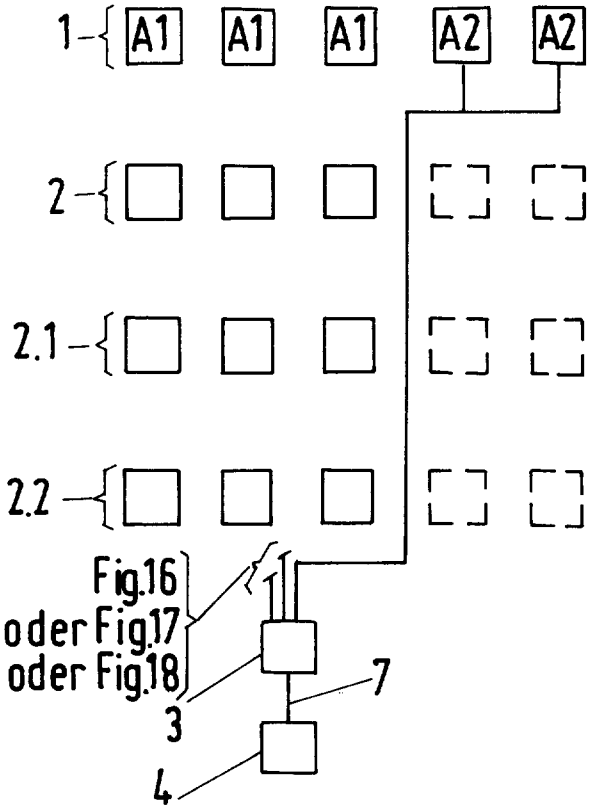


Fig.19

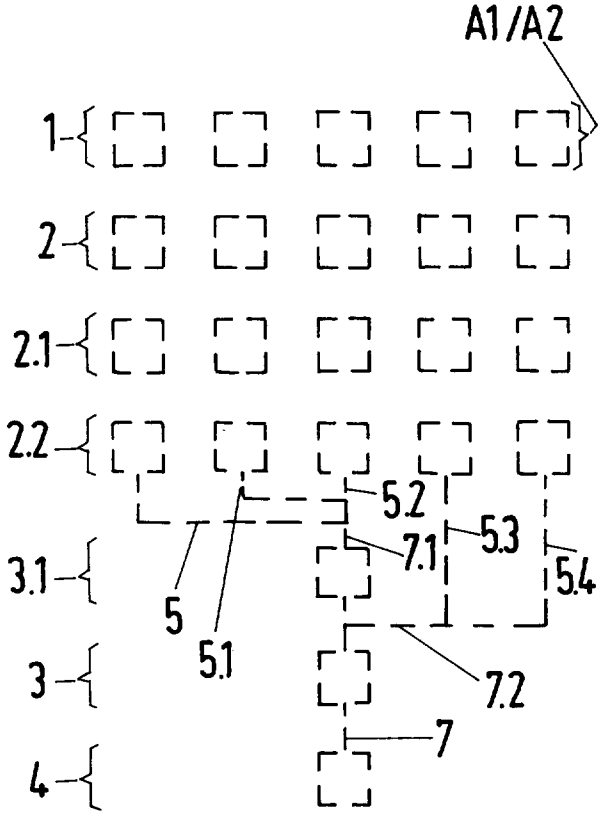
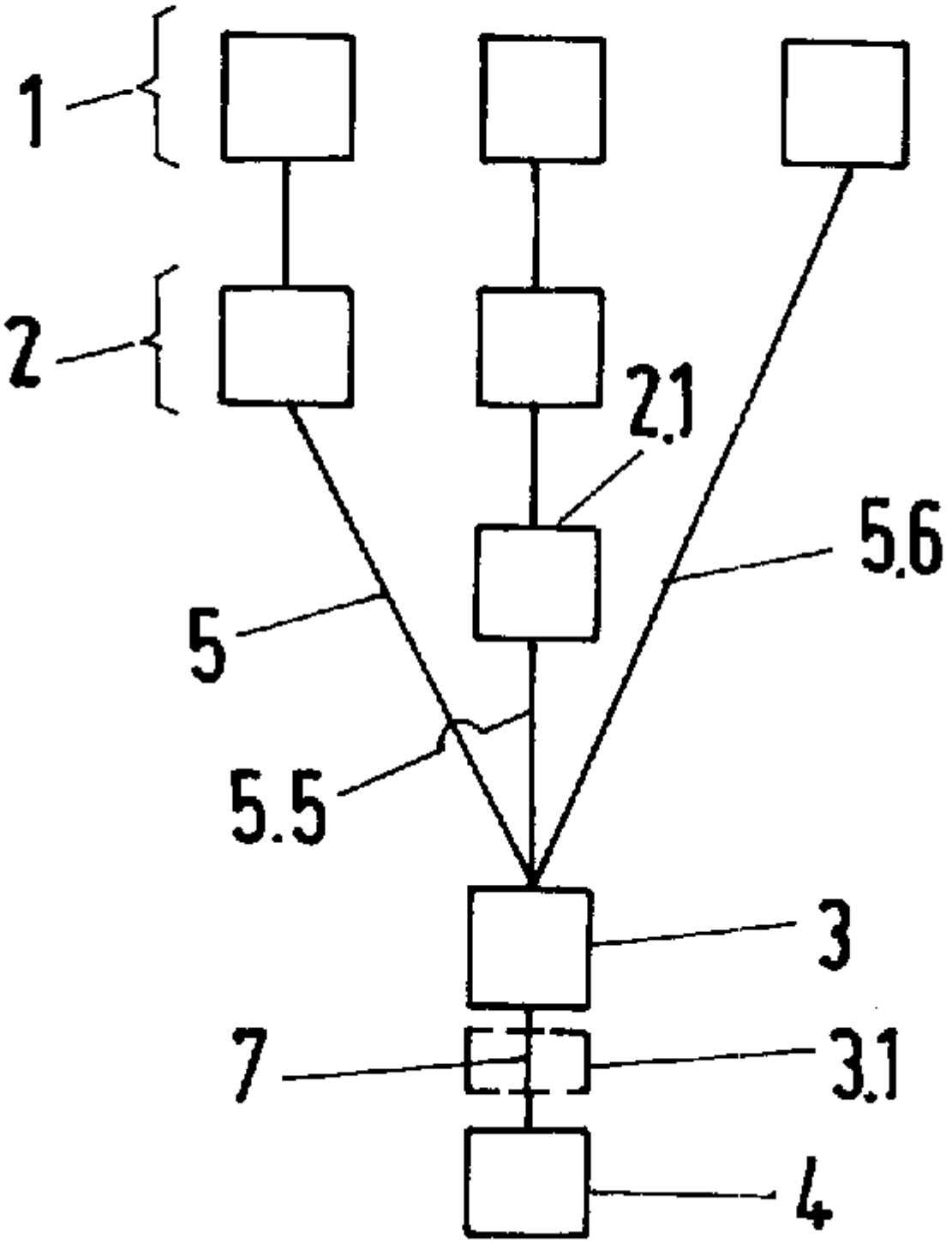


Fig.20


1
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2.1
5.6
5
5.5
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3.1
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