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(72) Feltaláló(k):
CORNELISSEN, Frank, NL-5962 NW Melderslo (NL)
VOGT, Christian, 49393 Lohne (DE)
DERKX, Matt, NL-5961 PX Horst (NL)
KRUSE, Torben, 49685 Emstek (DE)

(73) Jogosult(ak):
Pilzkulturen Wesjohann GbR, 49429 Visbek (DE)

(74) Képviselő:
Danubia Szabadalmi és Jogi Iroda Kft., Budapest

(54) **Rendszer és eljárás gombák termesztésére és betakarítására**

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

SYSTEM AND METHOD FOR CULTIVATING AND HARVESTING MUSHROOMS

Description

The invention relates to a system for cultivating and harvesting mushrooms, with a plurality of picking frames, which are located in a picking zone, wherein the mushrooms growing on a substrate are arranged on one level on the picking frames. Furthermore, the invention relates to a method for cultivating and harvesting mushrooms.

In the planting of edible mushrooms one generally distinguishes between light and dark cultivation. Asiatic mushrooms are cultivated in more or less bright light, whereas white or brown champignons are cultivated in the dark. The mushrooms grow on a substrate having a composition adapted to the particular species of mushroom. The basic components are, for example, straw, sawdust, wood shavings or other organic components. The substrate at first undergoes a decomposition process and is then disinfected by pasteurization. The substrate pretreated in this way is inoculated with the fungal mycelium under sterile conditions. In the case of champignons, the mycelium is cultivated on wheat grains. These are added to the substrate as so-called champignon brood. Depending on the mushroom species, the growth phase of the substrate and the following fructification phase are of different length. The champignon mycelium breaks through the substrate in around 15 days. After around 3 weeks, the first mushrooms can be harvested.

One known system is described by EP 1 064 836 A2. With the known system, champignons are cultivated in climate-controlled and darkened rooms. The mushrooms growing on the substrate are arranged in several levels one above the other on racks in mushroom beds. The mushrooms are harvested manually at regular intervals, after they have reached a certain size. The harvesting is done by means of gondola arranged movably on the rack. With the aid of the gondola, each individual mushroom in the climate-controlled room is manually picked by a picker standing on the gondola. The gondola is suspended from a rail on one side of the rack, for example, and can travel horizontally along the rack with the aid of running wheels.

One drawback of the already known system is that it can only achieve a relatively low picking performance. Picking performance is understood to mean the quantity of mushrooms harvested per unit of time. In mushroom farming, the picking costs make up 50-60% of the overall production costs. Hence, the need for systems and methods of mushroom farming

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which enable a maximization of the picking performance and thus a reduction in the picking costs is evident.

NL-A-9301347 discloses a system according to the preamble of Claim 1. NL-A-9001797 discloses a method according to the preamble of Claim 11. Thus, the problem which the invention proposes to solve is to provide a system for the cultivating and harvesting of mushrooms and a corresponding method with which the picking costs can be reduced.

This problem is solved by the invention with a system as claimed in Claim 1. In order to optimize the picking performance, at least one transverse conveyor is provided in the picking zone of the system according to the invention, the transverse conveyor being a belt conveyor which spans a plurality of picking frames arranged next to one another and has a conveying direction transverse to the longitudinal extension of the picking frames. The pickers pick the mushrooms from the substrate located on the picking frames and then place them on the transverse conveyor, which transports the mushrooms directly onward for further processing (e.g., weighing, packing, etc.). Advisedly, the transverse conveyor is movable in a motorized manner transversely with respect to its conveying direction at a variable speed. This means that the transverse conveyor moves continuously in the direction of the longitudinal extension of the picking frames while the pickers harvest the substrate. The pickers move along with the transverse conveyor, so that in succession the entire substrate located on the particular picking frame is harvested. The harvested mushrooms may be placed directly on the transverse conveyor, which is located within reach of the pickers. The speed of movement of the transverse conveyor should be variable in order to make possible an adaptation to the picking speed of the pickers. The substrate is harvested slower when there are still many mushrooms on the substrate, while the movement along the picking frames may be faster when the substrate has already been partly harvested.

Furthermore, a longitudinal conveyor may be provided in the system according to the invention, which is a belt conveyor with a conveying direction parallel to the longitudinal extension of the picking frames. The transverse conveyors transport the mushrooms placed on them to the longitudinal conveyor. The longitudinal conveyor then transports the mushrooms onward taking them to the further processing steps.

Preferably picking stations for individuals harvesting the mushrooms, i.e. pickers, are provided on the transverse conveyor, wherein each picking station has a scale for weighing the

mushrooms, and/or a fixed blade for severing the stalk ends of the mushrooms. The picking stations make it possible to weigh individually the mushrooms harvested by each picker. Typically the mushrooms are picked directly into containers in which the mushrooms also arrive afterwards at the stores. The pickers must make sure that each container has the correct fill weight. By means of the scale, furthermore, the individual picking performance of the individual picker can be determined. The blade secured in the area of the picking station serves for severing the stalk ends of the mushrooms. The severing of the stalk ends is part of the harvesting process and is indispensable for the quality of the end product. The fixed blade allows the picker to pick with both hands. She guides the stalk ends of the harvested mushrooms across the blade, so that they are cleanly severed. This further increases the picking performance.

Moreover, a weighing station can be provided in the system according to the invention to which the mushrooms present in the containers are taken by means of the transverse and/or longitudinal conveyor. The weighing station automatically weighs the mushrooms present in the containers and determines excess or under weight. Containers with too little content can be separated from the production line. Containers with too much content can have individual mushrooms removed from them in order to adjust the desired weight. Furthermore, a scan station can be provided, which reads a machine-readable code affixed to the mushrooms or to containers in which the mushrooms are present. For example, the pickers affix a barcode to the containers or to the mushrooms indicating which picker has picked the mushrooms present in the container. The scan station reads out this barcode and can thus match up the container with the picker. At the same time, the weight of the container is determined by means of the weighing station. Thus, the picking performance of the individual pickers can be determined automatically. This enables an automated determination of the picking wages.

According to another preferred embodiment of the system according to the invention, an irrigation system, which is integrated in the transverse conveyor, is provided for irrigating the substrate located on the picking frame, and the mushrooms growing on said substrate. The mushrooms continue their growth in the picking zone. Thus, a continuous irrigation of the substrate and the mushrooms must also be assured in the picking zone. The irrigation system may advantageously be integrated in the transverse conveyor, which is able to move by motor above the mushrooms, transversely to its conveying direction, i.e., in the direction of the longitudinal extension of the picking frame. For the irrigation, the transverse conveyor is

moved along the picking frame, while at the same time the irrigation system waters the substrate. The amount of water per substrate area can be regulated by varying the speed of movement of the transverse conveyor.

Finally, the system according to the invention may comprise at least one automatic picking machine, which picks the mushrooms growing on the substrate and transfers them to the transverse conveyor. The automatic picking machine may be arranged directly on the transverse conveyor, so that the automatic picking machine moves together with the transverse conveyor along the picking frame during the harvesting of the mushrooms. Automatic picking machines with which mushrooms can be automatically and selectively harvested are known from the prior art (cf. EP 0 593 680 B1).

In a preferred embodiment of the invention, a rack is provided, in which the mushrooms growing on the substrate are arranged on a plurality of levels one above another, wherein the rack is located in a growing zone which is separate from the picking zone, wherein the system comprises a transfer device which transfers the substrate together with the mushrooms from the rack onto the picking frames. In this embodiment of the invention, the growing of the mushrooms occurs in the growing zone, which is spatially separated from the picking zone, where the harvesting of the mushrooms occurs. The rack located in the growing zone may be used continuously for the growing of the mushrooms. A climate control takes place in the growing zone according to the requirements of the particular mushroom crop, so that ideal environmental conditions prevail for the growing. After the growing phase, the mushrooms are transferred by means of the transfer device to the picking zone. Here, the mushrooms growing on the substrate are present on the picking frame. On the picking frame, the mushrooms are present in one level, namely at a suitable working height, so that the mushrooms can be effectively picked by pickers standing next to the picking frame. The difficult to handle gondolas moving on the rack frame in traditional systems can be entirely eliminated for the harvesting in the system according to the invention. In the picking zone, the harvesting of the mushrooms occurs during a picking phase, during which the mushrooms also continue to grow further. Thus, the growth of the mushrooms in the picking zone occurs in parallel with the growth of the mushrooms in the growing zone. After the transfer of the mushrooms growing on the substrate to the picking frame, the racks in the growing zone can be outfitted at once with new substrate and mushrooms growing thereon.

It has been found that the efficiency can be significantly increased with the system according to the invention. The picking performance is considerably higher than with conventional pure rack systems. The higher surface requirement of the system according to the invention, which is due to the fact that the mushrooms growing on the substrate are arranged on one level on the picking frame, is more than compensated for by the significantly higher picking performance. This has to do with the fact that harvesting can be done constantly in the picking zone requiring a lot of surface. One does not have to wait for the growing to reach the first harvesting ripeness here. Namely, the growing occurs in the separate growing zone.

According to a preferred embodiment of the system according to the invention the substrate located on the various levels of the rack is in each case arranged on a belt section of a substrate belt, which belt section is displaceable in the longitudinal direction of the rack, wherein the belt sections can be coupled to one another by means of coupling elements arranged on the end sides of the belt sections. It is customary to place the substrate on a substrate belt which carries it. This is also routine with conventional pure rack systems. The fresh substrate on the substrate belt is introduced from the end face of the rack into the corresponding level. After the harvesting, the substrate on the substrate belt is pulled out from the rack. According to the invention, the belt sections of the substrate belt which are situated on the different levels in the rack can be coupled together for purposes of the transfer to the picking frame. The individual belt sections are coupled together during the transfer to the picking frame, so that they are arranged one behind the other on the picking frame. The belt sections coupled together can thus be transferred as a unit to the picking frame.

Advisedly the rack and the picking frame are aligned flush one behind the other in the longitudinal direction, wherein a traction device is provided which pulls the belt sections of the substrate belt, which are coupled to one another, during the transfer out of the rack onto the picking frame. The traction device may be, e.g., a cable winch which, during the transfer of the mushrooms growing on the substrate onto the picking frame, is arranged on that end side of the picking frame which faces away from the rack, wherein the cable of the cable winch can be coupled releasably to an end of one of the belt sections. After the end of the growth phase, the cable of the cable winch is coupled e.g. to the end of the belt section of the substrate belt which is uppermost in the rack. With the aid of the cable winch, this belt section is pulled out from the rack via the transfer device. Once the belt section has been pulled entirely out from the rack, the belt section situated in the level underneath, for example, is

coupled to the belt section already pulled out from the level above it. Then the two belt sections coupled together are pulled further by the cable winch. This process continues. The further belt sections are successively coupled to the belt sections already pulled out from the rack. Finally, all belt sections coupled to each other and arranged one behind the other are pulled by means of the cable winch onto the picking frame.

According to another preferred embodiment of the system according to the invention, the system comprises a belt coiler which winds up the substrate belt in order to empty the picking frame after the mushrooms have been harvested. During the winding up of the substrate belt, the harvested substrate located on the substrate belt falls off from it and can be disposed of. For example, a substrate pit can be provided for this, which is located in the area of an end face of the picking frame, and the substrate ends up in the substrate pit during the winding up of the substrate belt. The substrate can then be further transported from the substrate pit, e.g., in order to be recycled as fertilizer.

In another preferred embodiment of the system according to the invention, the transfer device comprises a guide frame for the substrate belt, wherein the guide frame has a variable inclination in order to balance out the height differences between the levels of the rack and the picking frame. The inclination of the guide frame is changed successively according to the heights of the individual layers of the rack when transferring the belt sections of the substrate belt from the rack to the picking frame.

The problem which the invention proposes to solve is furthermore solved by a method for cultivating and harvesting mushrooms as claimed in Claim 11. Exemplary embodiments of the invention shall be explained more closely below with the aid of drawings. There are shown:

Figure 1: schematic side view of a system according to the invention;

Figure 2: schematic top view of the picking zone of the system according to the invention.

The system represented in the figures comprises a rack 1, which is located in a growing zone 2. The growing zone 2 is a closed room, which can be climate controlled in order to create the ideal environmental conditions for the growth of the mushrooms. In the growing zone 2 there are found several racks 1 next to each other (in the direction perpendicular to the plane of the drawing in Figure 1). The rack 1 has several levels arranged one above the other, on which are

found mushrooms which are growing on a substrate 3. A transfer device 4 is provided, which takes the substrate 3 with the mushrooms out from the rack 1 and transfers it to a picking frame 5, which is located in a picking zone 6 physically separated from the growing zone 2. As can be noticed in Figure 1, the picking frame 5 has only a single level on which are found the mushrooms growing on the substrate after the transfer. The height of the picking frame 5 corresponds to the working height of the pickers working next to the picking frame 5, who manually pick the mushrooms from the substrate 3 located on the picking frame 5. As is indicated in Figure 2, the substrate 3 is located on one belt section 7 of a substrate belt. The substrate belt or the belt sections 7 are displaceable both on the picking frame 5 and in the rack 1. At their end sides the belt sections 7 have coupling elements 8, by which the belt sections can be coupled together. Figure 2 shows on each picking frame 5 four belt sections 7 coupled together by means of the coupling elements 8. Figure 1 shows a cable winch 9 arranged on the end face of the picking frame 5 facing away from the rack 1, whose pulling cable 10 is coupled to the end of the belt section of the substrate belt located on the transfer device 4. The belt section 7 located on the transfer device for its part is coupled via the coupling element 8 to the belt section of the substrate belt located on the second level from the top of the rack 1. Thus, the cable winch pulls the two belt sections 7 coupled together out from the transfer device or out from the rack 1 and onto the picking frame 5. The inclination of a guide frame 11 of the transfer device 4 is successively changed in order to couple the next substrate belt section 7. In this way, all belt sections with the substrate located on them and the mushrooms growing thereon are transferred in succession from the rack 1 to the picking frame 5. The transfer device 4 has wheels 12, on which the transfer device 4 can travel in the direction perpendicular to the plane of the drawing in Figure 1, so that the transfer device 4 can be used for several racks 1 arranged alongside each other for purposes of the transfer to corresponding picking frames 5.

Figure 2 shows a belt coiler 13 arranged in the end region of a picking frame 5, which winds up the substrate belt located on the picking frame 5 for the emptying of the picking frame 5 after the harvesting of the mushrooms. In this process, the substrate is loosened from the substrate belt and is delivered by means of conveying devices 14, 15 to a substrate pit 16. From here, the harvested substrate can be taken on to a further use, e.g., as fertilizer.

In Figure 2 it will be noticed that there are four picking frames 5 next to each other in the picking zone 6 of the exemplary embodiment shown. These are oriented flush with racks 1,

not represented in Fig. 2, in order to transfer the substrate with the mushrooms growing on it to the picking frames 5 as described above. In the picking zone 6 there are provided two transverse conveyors 17 in the exemplary embodiment shown, being belt conveyors respectively spanning two adjacently arranged picking frames 5 with a conveying direction transversely to the longitudinal extension of the picking frames 5. The transverse conveyors 17 are each movable by motor transversely to their conveying direction, i.e., in the longitudinal direction of the picking frames 5, at variable speed, as indicated in Fig. 2 by the double arrows. Furthermore, the system represented in Figure 2 has a stationary longitudinal conveyor 18, which is arranged in the space between the two upper picking frames 5 and the two lower picking frames 5. The conveying direction of the longitudinal conveyor 18 runs parallel to the longitudinal extension of the picking frames 5. At each of the transverse conveyors 17 there are arranged several picking stations 19 for pickers 20, each picking station having a scale for weighing of harvested mushrooms and a fixed blade for severing the stalk ends of the mushrooms. The pickers 20 harvest the mushrooms with both hands from the substrate located on the picking frames 5. They sever the stalk ends of the mushrooms by means of the fixed blade at the picking station. The picked mushrooms are placed in a container which is located on the scale of the picking station 19. Once the container holds the desired measure of mushrooms, the container with the mushrooms located therein is placed on the transverse conveyor 17 running above the substrate 3. In Figure 2 there are shown a plurality of containers 21 filled with mushrooms on the transverse and longitudinal conveyors 17, 18. The containers 21 are at first delivered by means of the transverse conveyor 17 to the longitudinal conveyor 18. The longitudinal conveyor 18 then delivers the containers 21 to a weighing station 22 and a scan station 23. At the weighing station 22, the individual containers 21 are weighed in order to determine whether they contain the correct measure of mushrooms. During the picking process, the individual pickers 20 apply a barcode to the containers 21. This is read by means of the scan station 23 in order to match up the container with the respective picker 20. In this way, the picking performance of each picker 20 is determined automatically. Finally, the containers 21 with the mushrooms arrive at an intermediate storage 24, from which they may be collected for further processing (e.g., packing).

The special efficiency of the system according to the invention results on the one hand from the successive linear arrangement of growing zone 2, transfer device 4 and picking zone 6, as

represented in Figure 1. On the other hand, the functionality and arrangement of the conveyors 17 and 18 in combination with the picking frames 5 on which the mushrooms growing on the substrate are arranged in only a single level brings about a significant boosting of picking performance.

In Figure 1, the rack 1 is filled with the substrate 3 at first from its left end face, as already explained above. Then begins the growth phase. After the end of the growth phase, the belt sections 7 which are coupled together and on which the substrate 3 is found are transferred from the rack 1 by means of the transfer device 4 to the picking frames 5. In the picking zone 6 there occurs a further growth of the mushrooms, while at the same time the mushrooms are harvested. After the complete harvesting, the substrate belt is pulled to the right and wound up by means of the belt coiler 13, whereupon the substrate is at the same time loosened from the belt and disposed of. The substrate 3 with the mushrooms growing on it thus runs continuously through the stations of growing zone 2, transfer device 4 and picking zone 6 in one direction (left to right in Figure 1).

During the harvesting, the pickers 20 pick the mushrooms from the substrate 3 while moving along with the transverse conveyor 17 moving along the picking frame 5 in front of the particular picking stations 19. In this process, the substrate 3 located on the picking frames 5 is harvested continuously. The harvested mushrooms are automatically delivered by means of the conveyors 17, 18 to further processing. The pickers 20 in particular do not have to interrupt the picking process in order to transport the full containers 21 away. The cumbersome handling of the gondolas, as described above and as is customary in pure rack systems, can also be eliminated in the system according to the invention. The boosted efficiency is further helped by the fact that the pickers 20 can use both hands for the picking. For the severing of the stalk ends of the mushrooms the blades affixed to the picking stations of the transverse conveyors 17 are used, as described above.

On the whole, it has been found that the picking performance can be almost doubled with the system according to the invention. The higher costs on account of the increased surface requirement of the system according to the invention are in this way more than compensated for.

RENDSZER ÉS ELJÁRÁS GOMBÁK TERMESZTÉSÉRE ÉS BETAKARÍTÁSÁRA

Szabadalmi igénypontok

1. Rendszer gombák termesztésére és betakarítására, több szedőasztallal (5), amelyek egy szedési zónában (6) találhatók, ahol a szubsztrátumon (3) növekvő gombák a szedőasztalokon (5) egy síkban vannak elrendezve, ugyanakkor a szedési zónában (6) legalább egy keresztirányú szállítószerkezet (17) van elhelyezve, amelynél egy több egymás mellett elrendezett szedőasztalt (5) áthidaló, a szedőasztalok (5) hosszanti kiterjedésére merőleges szállítási irányú szállítószalagról van szó,

azzal jellemezve, hogy a keresztirányú szállítószerkezet (17) a szállítási irányára keresztirányban változtatható sebességgel motorosan mozgatható.

2. Az 1. igénypont szerinti rendszer, **azzal jellemezve**, hogy van egy hosszanti szállítószerkezete (18), amelynél egy a szedőasztalok (5) hosszanti kiterjedésével párhuzamos szállítási irányú szállítószalagról van szó.

3. Az 1. vagy 2. igénypont szerinti rendszer, **azzal jellemezve**, hogy a keresztirányú szállítószerkezeten (17) a gombákat betakarító személyek (20) számára szedőállomások (19) vannak kialakítva, ahol mindegyik szedőállomás (19) egy mérleggel rendelkezik a gombák lemérésához és/vagy egy rögzített pengével a gombák szárvégeinek leválasztásához.

4. Az 1-3. igénypontok bármelyike szerinti rendszer, **azzal jellemezve**, hogy egy a keresztirányú szállítószerkezetbe (17) szervesen beépített öntözőrendszere van a szedőasztalon (5) található szubsztrátum (3) és az azon növekvő gombák öntözésére.

5. Az 1-4. igénypontok bármelyike szerinti rendszer, **azzal jellemezve**, hogy legalább egy polcállványa (1) van, amelyben a szubsztrátumon (3) növekvő gombák több síkban egymás fölött vannak elrendezve, ahol a polcállvány (1) egy a szedési zónától (6) elkülönített növekedési zónában (2) van elhelyezve, emellett a rendszer egy átvezető szerkezetet (4) tartalmaz, amely a szubsztrátumot (3) a gombákkal együtt a polcállványból (1) a szedőasztalokra (5) vezeti át.

6. Az 5. igénypont szerinti rendszer, **azzal jellemezve**, hogy a polcállvány (1) különböző síkjaiban található szubsztrátum (3) egy szubsztrátumszalagnak a polcállvány (1) hosszirányában elmozdítható egy-egy szalagszakaszán (7) van elrendezve, ahol a szalagszakaszok (7) a végoldalaikon elrendezett kapcsolóelemek (8) segítségével kapcsolhatók egymáshoz.

7. A 6. igénypont szerinti rendszer, **azzal jellemezve**, hogy a polcállvány (1) és a szedőasztalok (5) egyike hosszirányban egymás mögött egy vonalba van beigazítva, ahol egy húzószerkezet (9) van beépítve, amely az egymáshoz kapcsolt szalagszakaszokat (7) a polcállványból (1) való átvezetésnél a szedőasztalra (5) húzza.

8. A 7. igénypont szerinti rendszer, **azzal jellemezve**, hogy a húzószerkezet (9) egy kötélcsörlő, amely az átvezetésnél a szedőasztal (5) polcállványtól (1) távolabb eső homlokoldalán van elrendezve, ahol a kötélcsörlő (9) kötele (10) a szalagszakaszok (7) egyikének végéhez oldhatóan csatlakoztatható.

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9. A 6-8. igénypontok bármelyike szerinti rendszer, **azzal jellemezve**, hogy a szubsztrátum (3) a rajta növekvő gombákkal együtt a szedőasztalra (5) való átvezetés után a szubsztrátumszalag egymáshoz kapcsolt, egymás mögött elrendezett szalagszakaszain (7) található.

10. A 6-9. igénypontok bármelyike szerinti rendszer, **azzal jellemezve**, hogy van egy szalagtekercselője (13), amely a szubsztrátumszalagot a szedőasztalnak (5) a gombák betakarítása utáni letöltéséhez felcsévéli.

11. Eljárás gombák termesztésére és betakarítására, ahol egy szubsztrátumot (3) viszünk be rajta növekvő gombákkal egy polcállványba (1), amelyben a szubsztrátumon (3) növekvő gombák több síkban egymás felett vannak elrendezve, ahol a polcállvány (1) egy növekedési zónában (2) helyezkedik el, amelyben a gombák egy növekedési fázis során ellenőrzött környezeti feltételek mellett növekednek, ahol a növekedési fázis után a szubsztrátumot (3) a gombákkal együtt eltávolítjuk a polcállványból (1) és azokat egy szedőasztalra (5) vezetjük át, amely egy a növekedési zónától (2) térben elkülönített szedési zónában (6) található, ahol a szubsztrátumon (3) növekvő gombák a szedőasztalon (5) egy síkban vannak elrendezve, és ahol a gombákat a szedőasztalon (5) levő szubsztrátumról (3) egy a növekedési fázist követő szedési fázisban takarítjuk be,

azzal jellemezve, hogy a szedési zónában (6) legalább egy keresztirányú szállítószerkezet (17) van elhelyezve, amelynél egy több egymás mellett elrendezett szedőasztalt (5) áthidaló, a szedőasztalok (5) hosszanti kiterjedésére merőleges szállítási irányú szállítószalagról van szó, ahol a gombákat leszedjük a szubsztrátumról (3), tárolóeszközökbe (21) helyezzük és a gombákkal megtöltött tárolóeszközöket (21) a keresztirányú szállítószerkezetre (17) rakjuk le, ahol a keresztirányú szállítószerkezetet (17) a szedés során motorosan a szállítási irányára keresztirányban mozgatjuk, miközben a gombákat betakarító személyek (20) a szedőasztalok (5) hosszirányában a keresztirányú szállítószerkezettel (17) együtt mozognak.

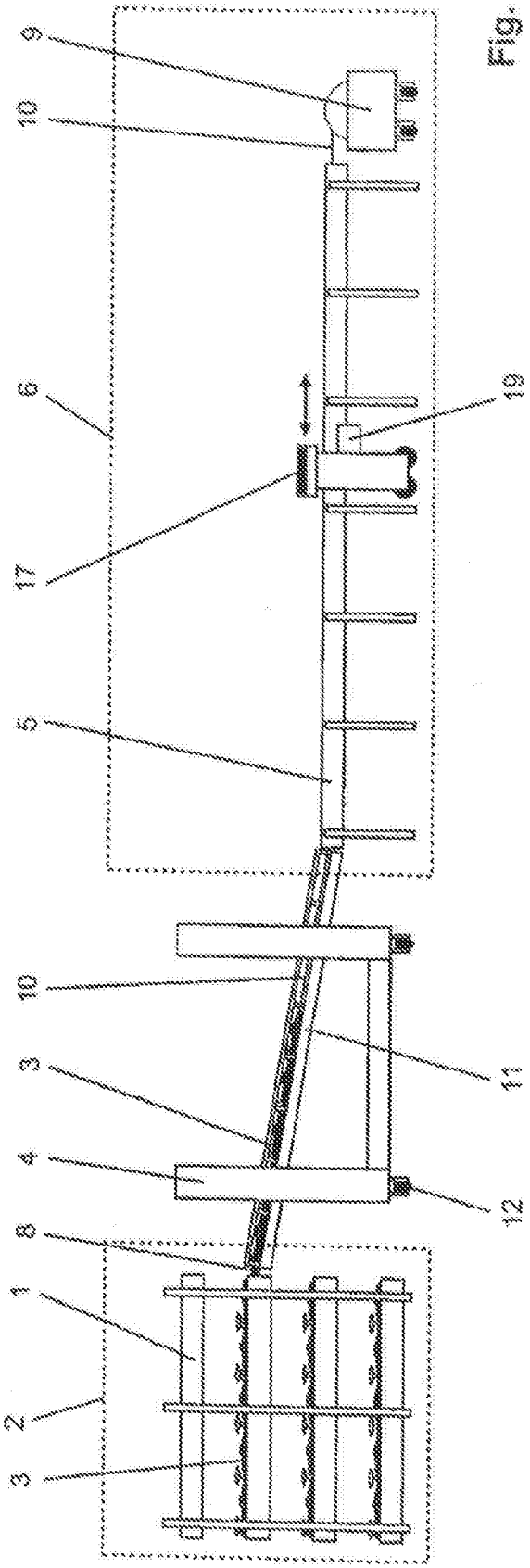
12. A 11. igénypont szerinti eljárás, **azzal jellemezve**, hogy egy hosszanti szállítószerkezetet (18) is alkalmazunk, amelynél egy a szedőasztalok (5) hosszanti kiterjedésével párhuzamos szállítási irányú szállítószalagról van szó.

13. A 11. vagy 12. igénypont szerinti eljárás, **azzal jellemezve**, hogy a polcállvány (1) különböző síkjaiban található szubsztrátumot (3) egy szubsztrátumszalagnak a polcállvány (1) hosszirányában elmozdítható egy-egy szalagszakaszára (7) rakjuk le, ahol a szalagszakaszokat (7) a végoldalaikon elrendezett kapcsolóelemek (8) segítségével kapcsoljuk egymáshoz.

14. A 13. igénypont szerinti eljárás, **azzal jellemezve**, hogy az egymáshoz kapcsolt szalagszakaszokat (7) az átvezetésnél a polcállványból (1) a szedőasztalra (5) húzzuk.

15. A 13. vagy 14. igénypont szerinti eljárás, **azzal jellemezve**, hogy a szubsztrátum (3) a rajta növekvő gombákkal együtt a szedőasztalra (5) való átvezetés után a szubsztrátumszalag egymáshoz kapcsolt, egymás mögött elrendezett szalagszakaszain (7) helyezkedik el.

Fig. 1



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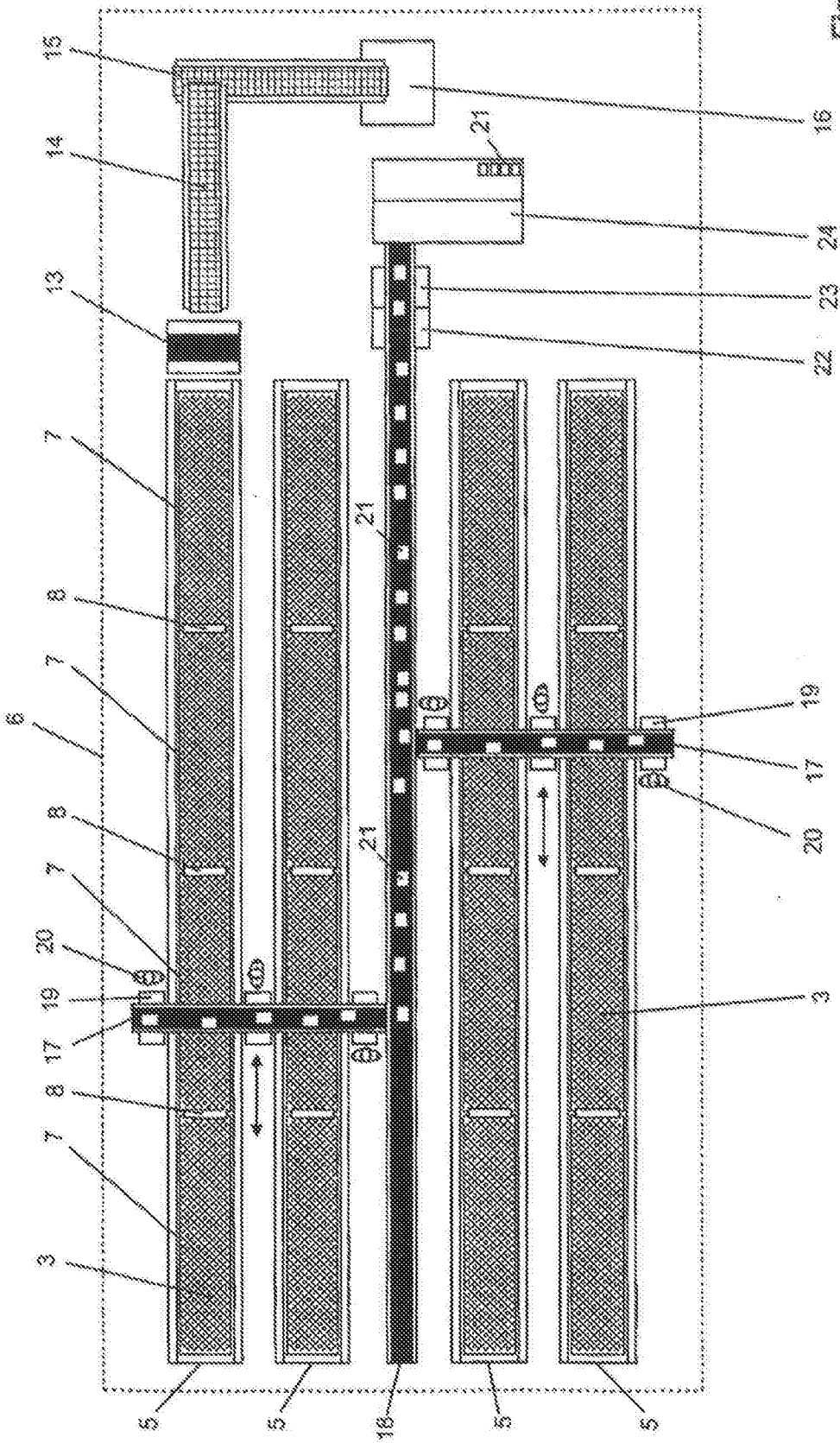


Fig. 2