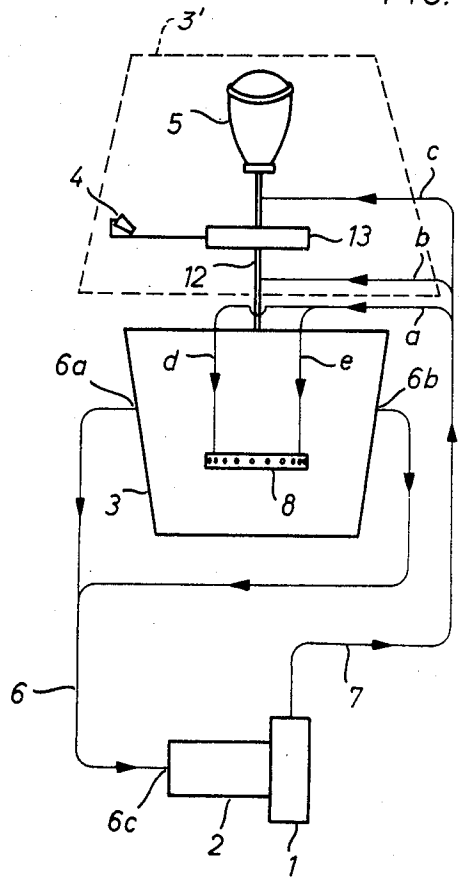
Nov. 30, 1965 R. SCHMIDT 3,220,223

MEANS FOR REMOVING DUST FROM CIRCULAR KNITTING MACHINES

Filed Dec. 5, 1962 2 Sheets-Sheet 1

FIG. 1



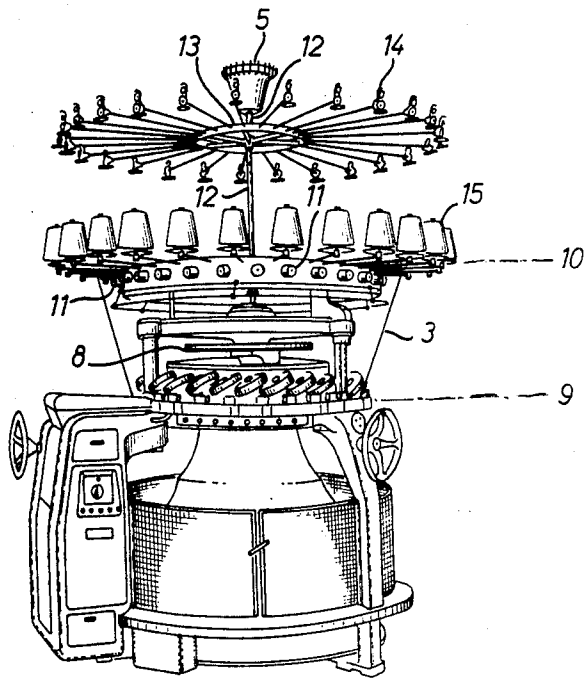
Inventor:
RICHARD SCHMIDT
By:
MICHAEL S. STRIKER
his ATTORNEY

Nov. 30, 1965 R. SCHMIDT 3,220,223

MEANS FOR REMOVING DUST FROM CIRCULAR KNITTING MACHINES

Filed Dec. 5, 1962 2 Sheets-Sheet 2

FIG. 2



Inventor:
RICHARD SCHMIDT
By:
MICHAEL S. STRIKER
his ATTORNEY

United States Patent Office 3,220,223
Patented Nov. 30, 1965

3,220,223

MEANS FOR REMOVING DUST FROM CIRCULAR KNITTING MACHINES

Richard Schmidt, Traibenstrasse 49, Stuttgart-Vaihingen, Germany

Filed Dec. 5, 1962, Ser. No. 242,486
Claims priority, application Germany, Dec. 7, 1961, M 51,104
6 Claims. (Cl. 66—168)

The present invention relates to means for removing dust from circular knitting machines, consisting of one or more housings in which the dust is raised and swirled up by an air stream and then sucked off by a suction system, in addition to means for depositing the said dust in a dust bag or blowing it into the open air.

Means for removing dust from circular knitting machines are known in a number of versions. The most simplified apparatus of this kind consists of blow tubes which point toward the spots where most of the dust is generated and simply blow the dust away. Another known apparatus uses suction to remove the dust. This kind of dust removal has not been generally accepted because it is not sufficiently effective.

The present invention is based on the principle of raising the dust by means of a blower at the spot where it collects, followed by sucking the dust off by means of a suction fixture. This method has the advantage of taking the air from the blow tubes directly to even relatively inaccessible spots without any damaging effect on the threads and the stitchforming tools when the dust is moved from the spots where it collects.

It is the object of the present invention to overcome the known disadvantages of prior art devices and to provide a housing, preferably of transparent material, around that part of the machine where most of the dust collects and from where the dust, when raised by the blow tubes, is sucked off and carried into the open air or into a dust-collecting bag. Such a dust housing may, for example, surround the circular knitting machine in the shape of a cylinder or cone, beginning below the needle cylinder and extending to a point above the thread feeding unit. The cylinder or cone surrounding the machine is covered on top and below by substantially horizontal face ends which are provided with passages for the finished knitting below, and for the incoming threads above. These passage holes in the face ends of the dust housing also serve to maintain a proper balance of pressure inside the housing. To prevent excessive speed of the incoming air, the dust housing is provided with additional air inlet holes.

The drawings show one embodiment of the present invention.

FIG. 1 is a diagrammatic illustration of the blowing and sucking means showing only the upper center axle **12** of the circular knitting machine and ring **13** of hollow tubular construction, to which thread tensioner **14** is attached. Also crown **5** to which the deflectors for the threads have been attached, which run from the yarn bobbins **15** in an upwards direction and are reversed at the said crown to run downwards over the thread feeders (feed wheels **11**) to the knitting points.

FIG. 2 is a view of the circular knitting machine and shows where the individual parts of the blowing and sucking means are located.

The drawings show blower **1** and its high-pressure line **7** with branching blow lines *a*, *b* and *c*. Blow line *a* branches off in several lines leading to the blow points. The drawing shows, for example, two blow lines *d*, *e* entering a ring-shaped tube **8** which is provided with blow holes. The holes in ring **8** are directed in such a manner that the air jet hits the substantial dust collecting spots, raising and swirling the dust. A cone-shaped dust housing

3 envelops the circular knitting machine in a zone extending from **9–10**, that is, it begins below the needle cylinder and ends above the feed wheels **11**. The compressed-air line *b* discharges into the hollow center axle **12** of the machine and carries the compressed air downwards to additional blow points inside dust housing **3**. Another portion of the compressed air flows to the hollow ring **13**, from where the air is blown into the air reflector **4** to remove the dust from thread tensioner **14**.

Line *c* carries compressed air through axle **12** upwards into crown **5** to remove the dust from the thread reversing points. This upper portion of the machine, beginning below thread tensioner **14** and ending above crown **5**, can also be surrounded with a dust housing **3'** indicated in dot-dash line in FIG. 1. Thread bobbins **15** are neither enclosed by upper housing **3** nor by the housing just named; they are in the dust-free open space of the workshop. Suction tube **6** which begins at **6***a* and **6***b* of dust housing **3**, enters the suction points of blower **1**, sucks the raised dust out of housing **3** and deposits the said dust in a dust box **2** between the suction tube outlet **6***c* and housing **1**, so that blower **1** feeds clean, compressed air into pressure line **7**.

The apparatus according to the present invention will not only clean the machine automatically from dust, but will also keep the air in the shop completely free of such dust.

Although the invention has been illustrated and described with reference to the preferred embodiment thereof and to its use on circular knitting machines, it is in no way limited to the details of the said embodiment or to such use, but is capable of numerous modifications within the scope of the appended claims.

I claim:

1. An arrangement for removing dust from a circular knitting machine comprising, in combination, at least one substantially closed housing surrounding a portion of the knitting machine; blow conduit means communicating at one end thereof with the interior of said housing for blowing air under pressure into said housing against portions of the machine on which dust is liable to collect so as to raise the dust and swirl it around in the housing; suction conduit means communicating at one end thereof with the interior of said housing for evacuating dust laden air therefrom; a source of air under pressure communicating with the other end of said blow conduit means; and suction means communicating with the other end of said suction conduit means.

2. An arrangement for removing dust from a circular knitting machine comprising, in combination, at least one substantially closed transparent housing surrounding a portion of the knitting machine; blow conduit means communicating at one end thereof with the interior of said housing for blowing air under pressure into said housing against portions of the machine on which dust is liable to collect so as to raise the dust and swirl it around in the housing; suction conduit means communicating at one end thereof with the interior of said housing for evacuating dust laden air therefrom; a source of air under pressure communicating with the other end of said blow conduit means; and suction means communicating with the other end of said suction conduit means.

3. An arrangement for removing dust from a circular knitting machine having a needle cylinder and a thread feeding unit comprising, in combination, at least one substantially closed transparent housing surrounding a portion of the knitting machine between said needle cylinder and said thread feeding unit, said housing having a peripheral wall substantially coaxial with the axis of the knitting machine and substantially horizontal top and bottom walls respectively formed with openings therethrough for the passage of threads into the housing

and for the passage of knitted fabric from said housing; blow conduit means communicating at one end thereof with the interior of said housing for blowing air under pressure into said housing against portions of the machine on which dust is liable to collect so as to raise the dust and swirl it around in the housing; suction conduit means communicating at one end thereof with the interior of said housing for evacuating dust laden air therefrom; a source of air under pressure communicating with the other end of said blow conduit means; and suction means communicating with the other end of said suction conduit means.

4. An arrangement for removing dust from a circular knitting machine having a needle cylinder and a thread feeding unit comprising, in combination, at least one substantially closed transparent housing surrounding a portion of the knitting machine between said needle cylinder and said thread feeding unit, said housing having a peripheral wall substantially coaxial with the axis of the knitting machine and substantially horizontal top and bottom walls respectively formed with openings therethrough for the passage of threads into the housing and for the passage of knitted fabric from said housing; a first blow conduit having an outlet end in said top wall substantially coaxial with said axis of the knitting machine; an annular tubular member arranged coaxial in said housing between said top and bottom walls thereof and being formed with a plurality of annularly spaced blow holes directed toward said peripheral wall of said housing; a second blow conduit communicating at one end thereof with said tubular member; suction conduit means communicating at one end thereof with the interior of said housing through portions of said peripheral wall for evacuating dust laden air therefrom; a source of air under pressure communicating with the other ends of said blow conduit means; and suction means communicating with the other end of said suction conduit means.

5. An arrangement for removing dust from a circular kniting machine having a plurality of thread bobbins, a plurality of thread tensioners above said bobbins, a plurality of thread reversing means above said thread tensioners, a needle cylinder and a thread feeding unit; at least one substantially closed transparent housing surrounding a portion of the kniting machine between said needle cylinder and said thread feeding unit, said housing having a peripheral wall substantially coaxial with the axis of the knitting machine and substantially horizontal top and botom walls respectively formed with opening therethrough for the passage of threads into the housing for the passage of knitted fabric from said housing; a first blow conduit having an outlet end in said top wall substantially coaxial with said axis of the knitting machine; an annular tubular member arranged coaxial in said housing between said top and bottom walls thereof and being formed with a plurality of annularly spaced blow holes directed toward said peripheral wall of said housing; a second blow conduit communicating at one end thereof with said tubular member; third blow conduit means having outlet ends directed to elements of the knitting machine above said thread bobbins; suction conduit means communicating at one end thereof with the interior of said housing through portions of said peripheral wall for evacuating dust laden air therefrom; a source of air under pressure communicating with the other ends of said blow conduit means; and suction means communicating with the other end of said suction conduit means.

6. An arrangement as set forth in claim 5 and including an additional transparent housing above said thread bobbins and enclosing said thread tensioners and said thread reversing means, said third blow conduit means communicating with the interior of said additional housing and said second conduit means also communicating with the interior thereof.

References Cited by the Examiner

UNITED STATES PATENTS

2,045,509	6/1936	Allred	66—168
2,944,414	7/1960	Malloy et al.	66—125
2,993,351	7/1961	Wheelock	66—168
3,073,106	1/1963	Tsuzuki	57—56

FOREIGN PATENTS

1,273,557	9/1961	France.

RUSSELL C. MADER, *Primary Examiner.*

DONALD W. PARKER, *Examiner.*