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THE BOBBIN & BEAKER. Organized in November, 1939, by Iota Chapter of Phi Psi Fraternity, and published and distributed without charge four times during the school year by students of the Clemson College School of Textiles. All rights reserved.

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This, the last issue by the Senior Staff, features two of the latest developments in the Textile Industries—Saco-Lowell’s new Duo-Card and Rovematic. Thanks are extended to Saco-Lowell in Easley, S. C., for this very interesting information.

We, the Senior Staff, have attempted to give something of interest to all of our readers, students, faculty, and textile management.

I want to thank all of our advertisers, who make this publication possible. The Junior Staff will now take over the magazine for the next four publications.

—R. E. W.
The DuoCard, A New Concept In Carding

A new concept in carding has been introduced to the textile industry by Swift Spinning Mills, Inc., of Columbus, Georgia.

Designed to broaden the potential of the card through increased production, improved quality and waste reduction, the DuoCard was designed and developed by Otis B. Alston, General Superintendent of the Swift Mills.

The DuoCard is two carding machines coupled together, and cotton is run through two cards rather than one. Millmen regard the DuoCard as the only major advancement in carding in nearly a century. W. Frank Lowell, Sr., President of Saco-Lowell, called the DuoCard "the answer to a problem on which the textile industry and machinery manufacturers have been working for years."

In the DuoCard system, two conventional cards are altered by removing the front delivery section of one card back to the doffer. The licker-in on the second card is replaced by a doffer which provides continuous high speed transfer of the carded fibers to the second cylinder. A finished carding action is given the fibers before they are placed in sliver form. The DuoCard system can be installed on any type card, and mills can adapt present cards to the system.

Seventy-five DuoCards have been operating in Swift’s Columbus plant for the past six months with production in some cases tripled, and the quality of the yarn improved. Fibers passed through cards are normally oval-shaped in cross-sections. However, fibers passed through the DuoCard have been found to be more nearly round and to make brighter fabrics.

Improvements in carding noted during the DuoCard operation include, an increase in production, a saving in floor space, and an improvement in quality. At Swift production has ben tripled. However, the increase in production will vary from mill to mill, depending on the results desired. Quality improvement can be accomplished with the same grade of cotton normally in use, or by using lower grade cotton. There is a definite decrease in neps in all grades, and the remaining neps are found to be less bulky. There has also been a decrease in time needed to strip cards. Cards are set at very close tolerances, and stripping has been practically eliminated. Metallic card clothing makes the DuoCard possible.

The problems of machine-picked cotton and over-ginning will be greatly helped by the new system. The process whitens or brightens fibers, operations clearly indicated.

The fibers from the first card are transferred to the second cylinder in an open and loose state with practically no damage. The transfer is from the heel of the wire to the point in all positions. The card acts as an evener and blender and consequently can be more positive in waste and nep removal.

(Continued on page 16)
We are now planning for our Summer Short Courses. This will be the fifth summer that we have offered this program. For the first time we are putting on a program in co-operation with an outside agency.

We are co-operating with the Southern Textile Methods and Standards Association in putting on two courses. One is a two weeks course in "Methods Analysis and Time Study" and the other is a two weeks course in "Methods Time Measurement." They will both be taught by Professor Joel Richardson. The Association will assist in the publicity.

The other courses are Yarn Manufacturing, Fabric Development and Supervisor Development. I especially recommend these first two for the trainee entering the textile industry who did not attend a textile school. The trainees are apt to enter a world of noise and confusion that makes no sense to them. If they attend these courses they will be taught what the machines are supposed to do, how they are supposed to do it, the theory of manufacturing and mill calculations.

The Supervisor Development Course is to acquaint the first line supervisor with the complex ramifications of his job. As the manufacturing problems become more complicated, this first line supervisor should be better prepared.

There are no entrance requirements and no college credit. If you are interested in more details drop me a line.

* * * * *

The enrollment in the school of textiles is the highest it has been in several years. The enrollment for this (the second) semester is 319 compared to 286 at the same time last year.

* * * * *

We are in the process of setting up a tandem card. I hope to get the whole thing largely as a gift. Reeves Brothers gave us two cards, Hollingsworth is clothing the cylinders doffers and liker-ins and Ashworth will clothe the flats.

* * * * *

Professor Joel Richardson has been elected secretary of the Southern Textile Methods and Standards Association. Professor La Roche is in the process of being elected secretary of the American Quality Control Association, Textile Division and Professor McKenna is a treasurer of the Southeastern area of American Association for Textile Technology. Professor Campbell is on the Board of Directors of the Greenville Chapter of the Society for Advancement of Management.
By
Jerry W. Blackwood. TM '64

DONALD D. HASTY
Donald D. Hasty is a Textile Management major from Camden, South Carolina; he is twenty-two years old and is married. Don has received a SCTMA scholarship to help finance his expenses at Clemson.

While at Clemson, Don has been an active member of SAM, Phi Psi, and AATT. During his Sophomore year he was a member of the Fershing Rifles. Last semester he served as a Hall Counselor in the 8th "barracks."

ARCHIBALD M. CALHOUN
Archibald M. Calhoun, a twenty-one year old Clio, South Carolina, native, is a Textile Management major. He received honors during the second semester of his Junior year.

Last summer, "Mac" gained first-hand experience in the textile industry when he was employed by James Fabrics, a division of Burlington Industries in Cheraw, South Carolina.

"Mac" has been an active participant in intramural basketball during his four years at Clemson. Other of his varied activities include two years in Phi Psi, one year in NTMS and SAM, and three years with the Clemson College Glee Club.

JOHN DAVID BEVILL
John David Bevill is a twenty-one year old Textile Science major from Anderson, South Carolina. To aid with his college expenses, he received a Lowenstein Foundation Scholarship.

Dave has been kept busy by participating in several campus activities; these include: Phi Psi, Clemson Skin Diving Club, AATT, Dixie Sky Divers, and Hall Counselor of of B-9. He is enrolled in Advanced Army ROTC and is presently serving as Company Commander of Company B-2.

For the past five summers Dave has been employed by Orr Mills in Anderson. After graduation he plans to work in some phase of research in the Textile Industry.

Don is a Distinguished Military Student and serves as Company Commander of Company D-2 in the Army ROTC. Upon graduation he plans to enter Flight Training in the United States Army.
Rovematic Roving Frames

The Rovematic Roving Frame is Saco-Lowell’s new answer to the problem of demands for increased production on the roving frame. The first of the new roving frames moved off the production line in September, 1961, at Saco-Lowell Shops, Easley, S. C. Now it has been said that orders for the Rovematic has given the company a backlog of unfilled business extending well into 1962.

Unlike any roving equipment in use today, the Rovematic operates at speeds up to 1,200 RPM, and builds a 14 x 7 inch package. All the mechanisms normally located under the roller beam have been moved into the head end. The flyer is radically changed and is not removed from the frame for doffing.

According to reports from Saco-Lowell, “Ends down are virtually eliminated in the area between the front roll and flyer. In processing 1:00 bank roving, the Rovematic will doff in 3-1/4 hours and a 96-spindle frame can consume 96 bales of cotton per 120-hour week.”

Lubrication problems are lessened with a new oil system. Mechanisms in both gear boxes are continually bathed with oil from a control pump. The main attention required is to check the oil level at several inspection windows.

A tandem differential mounted on a single shaft gives power to the Rovematic drive. Power is distributed to the flyers, spindles and spindle lead screws from this shaft.

The drafting element is described as a “marriage” of the Tru-Set top arm weighting system and the FS2 roll and apron arrangement used for some years on Saco-Lowell frames. Anti-friction bearings handle the high front roll speeds required and reduce the customary lubrication schedules.

A new spindle and flyer arrangement used on the Rovematic is regarded as the significant change. The spindle assembly is a telescoping structure made up of two tubes. The inner traversing tube called the spindle is keyed against relative rotation to the outer tube called the bolster. A lead screw is mounted inside the spindle and engages a socket in the top of the bobbin.

Saco-Lowell has broken with conventional practice in building the Rovematic flyer, which is not removed from the frame for doffing. It has a head and foot end connected by lengths of steel tubing. The drive is through a splined connection in the foot end. The head is carried in a ball bearing mounted on a bracket projecting from the roller beam.

Both top and bottom have substantial rims which provide areas where weight can be removed by drilling for precision dynamic balancing. The paddle or pressure foot is made from diecast aluminum. Because of its light weight and tying together the flyer at both ends, flyer leg deflection is minimized.

A rubber nose piece on the flyer traps the twist between the top of the flyer and the bite of the front rolls, strengthening the strand. This is helpful in preventing end breakage at the front roll.

(Continued on page 12)

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THE BOBBIN AND BEAKER
The Rovematic also has a flyer positioning system which is designed to automatically stop each flyer in the best position for piecing-up when an end comes down. The frame comes to a complete stop and then inches forward until the flyers are in the proper position.

Tension problems caused by belt slippage have been overcome in the Rovematic by use of a PIV (positive infinitely variable) drive, manufactured by the Link-Belt Co., Chicago. This drive, the twist gearing, lay gearing and differential are mounted in one oil-tight gear box. The builder mechanism is housed in a second box. These mechanisms are continually bathed with oil from a control pump.

The spindle and flyer assemblies are carried in ball bearings at all points where loads are appreciable. Spindle cases are oil tight. Gears on the lower drive shaft dip into oil in the bottom of the cases and throw it over all the internal parts, thus eliminating manual lubrication of spindle and flyer assemblies and their gear drives.

A totally enclosed fan-cooled motor delivers power to the flyer drive gear of the differential. This gear drives the flyer drive shaft in the spindle case at constant speed and acts as an idler to the flyer drive.

Actually, the differential is a tandem differential in which Saco-Lowell engineers have mounted two differentials on the same shaft.

Attached to the flyer drive gear is the bobbin ring gear. This meshes with a pair of planet gears and the bobbin drive gear which transmits power to the bobbin drive shaft and the bobbin sun gear.

WANTED: Textile Graduate with some time of actual experience in preparatory, weaving or chemistry, mechanically inclined as shop apprentice and eventually sales/or management.

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A study of the accompanying illustration will show that if the bobbin sun gear is held stationary, the speed of the bobbin drive gear will be proportional to the flyer drive gear and the gear ratios in the remainder of the drive are such that flyers and bobbins would turn at the same speed. It is also obvious that if the sun gear is turned in the same direction as the flyer drive gear, the bobbin drive gear will turn faster and the bobbins will lead the flyers. This speed increment, added by the sun gear, is called the winding speed and must vary inversely with the package diameter. The variable speed of the bobbin sun gear is supplied by the PIV.

The bobbin drive gear and its cage are keyed to the central shaft of the differential and thereby turn the lead screw ring gear at the opposite end of the unit at the same speed. The lead screw ring gear meshes with two planets which also mesh with the lead screw sun gear.

If the lead screw sun gear is held stationary, the lead screw drive gear will turn in proportion to the bobbin drive gear and the gear ratios in the remainder of the train are such that the lead screws and the spindles will turn in unison and no traverse will result.

If the lead screw sun gear is turned in the same direction as the lead screw ring gear, it is obvious that the lead screws will turn faster than the spindles and the bobbins will traverse down.

The lay gearing which drives the lead screw sun gear incorporates a change gear to vary its speed and thereby the rate of bobbin transfer. This, of course, determines the lay or distance between wraps on the bobbin.

The lay gearing also incorporates a pair of reversing clutches which are controlled by the builder. These determine the direction which the screw drive sun gear turns and therefore the reversals of the bobbin traverse. These clutches are the counterpart of the familiar twin gears on the conventional roving frame.

The builder's first function is to control the traverse reversals so that the length of traverse will shorten as each successive layer of roving is put on the bobbin. To accomplish this, Saco-Lowell provides a rocker shaft which connects the reversing clutch in the main gear box with the builder housing. A variation of a "load and fire" mechanism operates the rocker shaft, "firing" the shaft in successively shorter periods of time. The rate of shortening is determined by a change gear on the outside of the builder housing, which corresponds to the conventional taper gear.

The second function of the builder is to control the PIV so that the bobbin's RPM will decrease in just the right amount with each new traverse. The Rovematic accomplishes this by use of a 180° plate cam mounted on a shaft protruding from the back of the builder housing. The PIV control arm protruding from the side of the main gear box engages this cam. The plate cam rotates in very small increments with each traverse change in the builder mechanism and this controls the output speed of the PIV. The amount of rotation of the cam at each traverse change is determined by a change gear mounted on the front of the builder housing. This is the counterpart of the familiar tension gear on conventional frames.

(Continued on page 15)
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THE BOBBIN AND BEAKER
Four steps are required in doffing the Rovematic.

1. A clutch handle on the front of the machine disconnects the drive from the PIV and the bobbin sun gear, locking the gear against rotation. This makes the spindles and flyers turn at the same speed so that the frame can be jogged and loose roving run up on the top of the flyer.

2. A small hand wheel, located just above the clutch handle mentioned above, enables the operator to reset the builder to its maximum traverse position and to reset the PIV unit to its original starting or empty package position.

3. In order to run the bobbins down to their lowest point in the traverse, a separate motor drives the lay gearing with all other gears in the head and stationary. This turns the spindle screws and the packages will traverse down.

4. In this position, the packages are ready to be doffed without removing the flyers.

In developing the Rovematic, Saco-Lowell has attempted to eliminate the possibility of human error as much as possible. Only time and extensive usage of the Rovematic will tell whether this goal has been accomplished or not. In the Rovematic, Saco-Lowell has given us a new concept in roving frames. Will it do for you?
THE DUOCARD, A NEW CONCEPT IN WEAVING

Continued from page 6)

Since the two card cylinders operate in conjunction with each other, frequently it is not necessary to compromise on various settings. Each cylinder can be individually set to provide a specific quality control feature.

Results of tests run by Swift Spinning Mills show graphically the values of the DuoCard System. A detailed controlled test was set up at Swift with the DuoCard being run against a standard type card, both with the same type clothing and being in equal mechanical condition. All stock was controlled from the bale and through the processing equipment to eliminate any variable other than the cards themselves.

A thirteen ounce lap was fed to each of the card sets, and a resultant grain sliver of 55 grains per yard was delivered. Production at 100% efficiency on the DuoCard was 22.37 pounds per hour, and on the standard card the production was 8.10 pounds per hour. Flat strips on the DuoCard were 1.37%, and on the standard card the flat strips were 2.67%. Motes and fly waste on the DuoCard was 0.85% against 1.02% on the standard card. The total waste on the DuoCard was 2.55% against the standard card total waste of 3.87%.

The decrease of up to 1.3% in waste removed at the DuoCard has not affected the quality of the yarn because it can be set to remove the type and quality of waste on a more selective basis.

Uniformity on the DuoCard was a 2.2% reading, and on the standard card the reading was 3.2%. Neps in the DuoCard were checked on the Uster Imperfection Counter, utilizing 26s carded knitting yarn with a sensitivity of 3 on the imperfection counter. There were 60 neps in the DuoCard compared to 106 in the standard card. In the knitted fabric the DuoCard produced a brighter fabric. The yarn had a resultant skein break factor of 2088, and the U percent obtained from both the DuoCard and the standard card was approximately 14.1% U.

The imperfections per 1,000 yards were as follows. With the sensitivity set on 40 for thin places, the DuoCard reading was 300 vs. the standard card reading of 498. With the sensitivity set on 3 for thick places, the DuoCard reading was 100 vs. the standard card reading of 184. With the sensitivity set on 3 neps, the DuoCard reading was 60, and on the standard card the reading was 106.

The skein break factor averages about 3% better on the DuoCard. Ends-down in spinning averaged 8.11 per 1,000 hours on the DuoCard, and 9.0 on the standard card. Yarn produced from the DuoCard is cleaner, brighter, and has up to 70% nep count reduction.

The DuoCard should not require any change in quality control techniques. The frequency of checking DuoCards might possibly be reduced because of the increase in production.

The DuoCard System will not deter the trends toward automation of textile mills, but it should enhance automation.

P L E A S E!

Changed Address Lately?

Help us to keep our files up to date. Our sincere thanks to all of you who answered our appeal in the last issue. If you haven't answered, please fill in the form below and mail to:

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TUBES and CORES - For every textile need. Parallel, convolute or spiral construction. Special treatments for strength, moisture resistance, etc. Made in colors, lacquer ends; with printed, smooth, rough or plain surface. Up to 48" I.D.

SPOOLS - Wide range of styles, sizes. All fibre, or with fibre barrel and plastic heads. Single head spools in all fibre or all plastic with special surfaces.

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DUROWELD TUBES - Exceptionally strong and durable; molded by Sonoco's exclusive Duroweld Process. Micrometer tolerances; accurate balance. Complete information on request.

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