

TO BE USED ONLY FOR MATERIAL DRAWN FROM STORES FOR MANUFACTURING ORDERS					BILL OF MATERIALS		CORONA TYPEWRITER COMPANY, INC.	
STORE NO.	DELIVER TO	DEPT. NO.	PART NO.	FOR ORDER NO.				
				QUANTITY	UNIT	SIZE	GRADE	6404
KIND								
DATE		QUANTITY GIVEN OUT		UNIT PRICE		TOTAL VALUE		
DELIVERED BY		DATE		ORDERED BY		DATE		
BALANCE PER BIN TAG		POSTED TO S. L. & PRICED BY		EXTENDED BY		ENTERED ON MATERIAL SUMMARY		
ROUTING-1 TO STORE 2 TO PLANNING DEPT. (STORES DIV.) 3 TO COST DEPT.								
342-9412-2000-7-22								

Fig. 14. Bill of Materials.

signed by the inspector and supervisor of the department doing the work. The inspector signs all tickets because nearly all of our work is piece work and we do not pay operators for work which they perform that is not up to standard quality. Tickets are signed by the supervisor of the department because he may find it necessary to change operations from piece work to day work. All such changes, however, must be approved by the works manager or his assistant before day work will be paid for piece work operations. The original copy of the operation cost ticket is sent to the pay roll division of the cost department, and from there to the cost clerk. The duplicate is sent to the dispatch clerk in the control board division and all work shown as completed is posted on the control boards.

**Bill of Materials.** The bill of materials is made out in duplicate and is sent to the raw material stores by the dispatch clerk. The stores keeper issues the material to the department indicated and at the time specified, and then sends the bill of materials to the balance of stores clerk where it is entered on the balance of stores ledger, priced and extended, and forwarded to the cost department.

**Parts Forwarding and Identification Ticket.** All parts are forwarded from one operation to another on parts forwarding and identification tickets (Fig. 15). Every pan of work must have one of these tickets and they must be O.K.'d by the inspector before the parts may be physically moved from a planning center. A copy of the parts forwarding and identification ticket

PARTS FORWARDING AND IDENTIFICATION TICKET			
332-7524 (2000-4-21) Corona Typewriter Company, Inc.			
Order No.	Part No.	Quantity	Date
Name of Part			
Oper. No.	Operation Name		
Counted and Sent Out By			O. K. Inspector
Counted, Checked and Received By			
From Dept.	From Oper.	To Dept.	To Oper.
This form only for forwarding parts between Operators and Mfg. Depts.			
1. ORIGINAL. RCV 12-25-52. This copy is for with parts and issue forwarded.			

Fig. 15. Parts Forwarding and Identification Ticket.

is sent to the scheduling division of the planning department where it is filed for reference. When a manufacturing order is issued an entry is made in the parts ledger under "On Order" column. When a parts forwarding and identification ticket covers parts being forwarded from material to the first manufacturing operation, an entry is made in the parts ledger, transferring parts from the "On Order" to "In Process" column. Where parts are forwarded from the last operation to finished parts stock, we use a parts forwarding and identification ticket of a different color to facilitate sorting. All parts forwarding and identification tickets that accompany parts to finished parts stock are posted in the parts ledger and the parts are transferred from the "In Process" to the "Finished Parts" column.

**Requisitions for parts.** All requisitions for parts from finished parts stock are sent to the Parts Ledger Clerk and are posted in the parts ledger, deducting the quantity from the "Finished Parts" and the "Available and On Order" columns.

**Assembling Operations.** As previously stated assembling operations are begun in our Cortland plant. The first step in assembling is known as sub-assembling. Here we have parts requisitioned to jobs from the finished parts stock room and delivered to the jobs in standardized trays to increase operator efficiency. All operations are on piece work and highly standardized tools and fixtures are used. When the sub-assemblies are completed they are sent to the assembly stock service division where they are placed in trays with other parts and are issued to the various jobs on which they are used.

Major assembly operations begin with the numbering of the frame, all frames being numbered serially. Assembly work is progressive, there being a certain number of girls or men performing the same work on a job. When a frame is numbered it is placed on a rack on the front of the work bench within easy reach of the operator and upon completion of the next operation it is placed on the next bench and so travels from one end of the room to the other so that there is a continuous flow until assembly work is completed. Up to the time a machine reaches what is known as the key board operation all machines are identical. Starting with the key board operation, however, the identity of machines is established through the stamping of the assembly card, which I describe later. The card is stamped to show whether it is a No. 20 key board, which would be a regular American key board, a No. 28, which would be English, etc. At the same time it is stamped to show whether it is a Pica, Elite, Medium Roman, etc., type, and whether it has Gothic or plain figures. When this information has been stamped on the card, the corresponding key board is assembled and corresponding type are soldered on after the key board assembly, and when the machine reaches the part final assembly, a carriage with Elite spacing or Pica spacing, as the case may be, is assembled to the machine.

The information which enables the key board job to stamp the assembly cards is received from the planning department each week. They in turn depend on the order department of the general administrative organization for the figures showing the kinds and quantities of each keyboard that are to be manufactured. The

order department, of course, knows the production planned for the month, and they simply apportion orders on that basis.

Upon completion of the machines in Cortland they are placed in cases and shipped to Groton, removed from the cases and adjusted, inspected, aligned, inspected for alignment, and then sent to the final inspection and from there by belt conveyor to the stock and shipping room.

**Assembly Card.** Unlike parts manufacturing the operator's time is not recorded by ringing an operator in and out on a cost ticket, instead we have substituted the assembly card (Figs. 16 and 17), which is a card doubled over with perforated strips on the under part, bearing the number and name of each job, serial number of the machine, which the card accompanies, and place for date and clock number of the operator. As the card travels forward with the machine, the stub is filled in by the operator for the job which he performs and is torn off and retained until the end of the day when all stubs are turned into the department clerk and are carefully checked. The clerk then makes out an output report for each job and also makes out time tickets for each operator, entering the number of assemblies on the ticket corresponding with the stubs turned in. All assembling jobs are on piece work. Job inspectors, though on day work, tear off and turn in the stubs in the same way.

On the front of the assembly card there are three strips, all bearing the machine number, the long one giving the key board information, the numbers and names of all jobs and providing space for the clock number of the operator, and the date. When an operator tears off and fills in a strip he also fills in his number and the date on the front of the card. After a machine has been completed on final inspection there are no strips left to be torn off on the under part of the card and all information has been filled in on the larger card on the upper section. This is then torn off, the sample of the machine's work made by the aligning inspector is attached and the card is finally filed in the works manager's office. Of the two remaining stubs of the card, one is forwarded to the order department when the machine reaches stock and the other remains with the machine until it has been shipped and is then sent to the order department.

All the stubs turned in by operators are sent to the planning department and are sorted and collected by machine number and if any are missing a prompt inquiry is made. This insures the clearing of all machines