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INTERNAL SORT PROCESS

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4 Sheets Drawing. 19 Pages Specification

A novel internal sort process is presented whereby, if the primary storage area made available for the sort has the value LL, there can be utilized a secondary storage area having the value RxLL in carrying out the sort. Given an input sequence of records to be sorted, the term LL denotes the number of records which can be accommodated in the available primary storage area and the term R is a multiplier of LL which can be selected by the user. In the process the secondary storage area of capacity RxLL records is employed to form a reject list. The reject list receives, in order, those items in the input sequence that are smaller than the items currently in primary storage up to its capacity of RxLL. Then, when the current output string can no longer be extended, the items in the reject list are first processed at the inception of the formation of the next output string before the next items in the input sequence are considered. This latter stage of the process will result in re-rejected items, but they eventually will find their way to an output string. Accordingly, with this process, there is enabled the production of strings whose lengths can be thereby increased, the degree of increase being dependent upon the selection of the value of the term R.

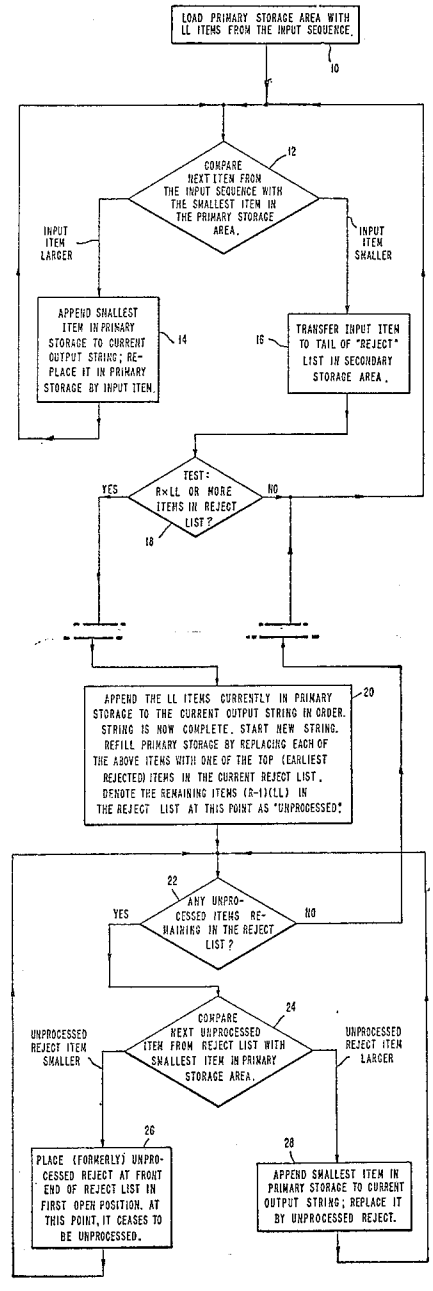
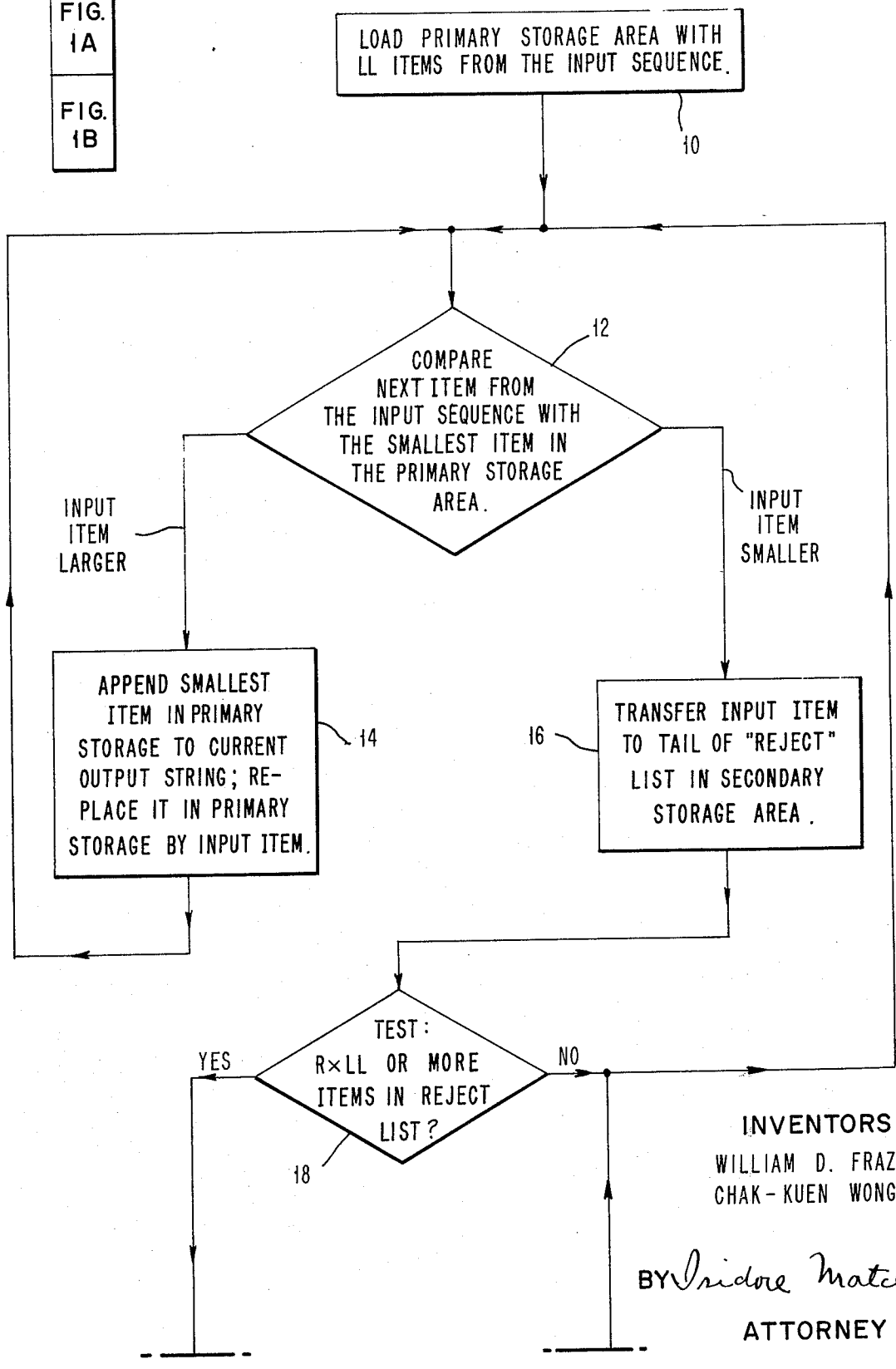


FIG. 1

FIG. 1A
FIG. 1B

FIG. 1A



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FIG. 1B

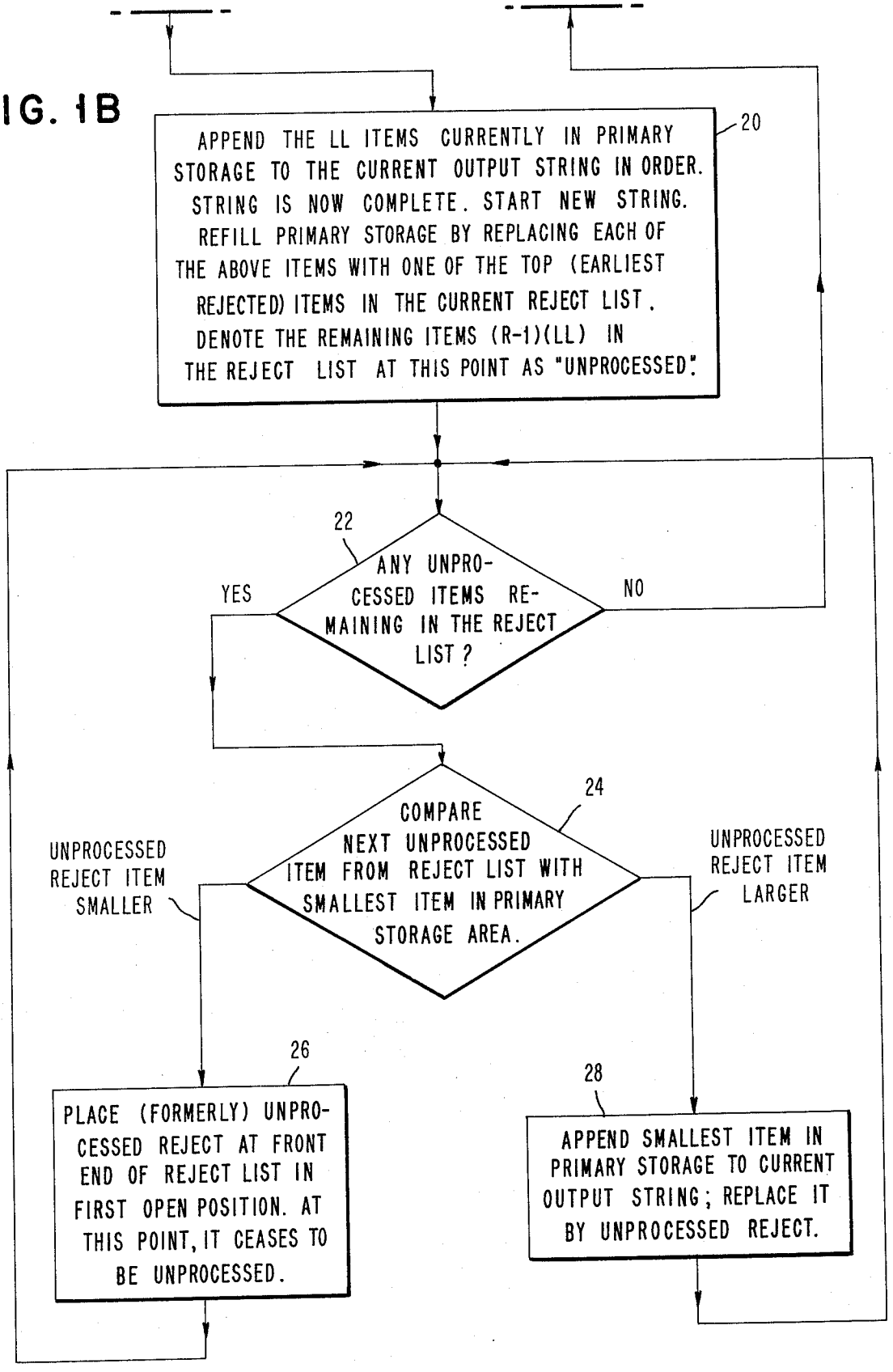

APPEND THE LL ITEMS CURRENTLY IN PRIMARY STORAGE TO THE CURRENT OUTPUT STRING IN ORDER. STRING IS NOW COMPLETE. START NEW STRING. REFILL PRIMARY STORAGE BY REPLACING EACH OF THE ABOVE ITEMS WITH ONE OF THE TOP (EARLIEST REJECTED) ITEMS IN THE CURRENT REJECT LIST. DENOTE THE REMAINING ITEMS (R-1)(LL) IN THE REJECT LIST AT THIS POINT AS "UNPROCESSED."
20
22
ANY UNPROCESSED ITEMS REMAINING IN THE REJECT LIST ?
YES
NO
24
COMPARE NEXT UNPROCESSED ITEM FROM REJECT LIST WITH SMALLEST ITEM IN PRIMARY STORAGE AREA.
UNPROCESSED REJECT ITEM SMALLER
UNPROCESSED REJECT ITEM LARGER
26
PLACE (FORMERLY) UNPROCESSED REJECT AT FRONT END OF REJECT LIST IN FIRST OPEN POSITION. AT THIS POINT, IT CEASES TO BE UNPROCESSED.
28
APPEND SMALLEST ITEM IN PRIMARY STORAGE TO CURRENT OUTPUT STRING; REPLACE IT BY UNPROCESSED REJECT.

FIG. 2A

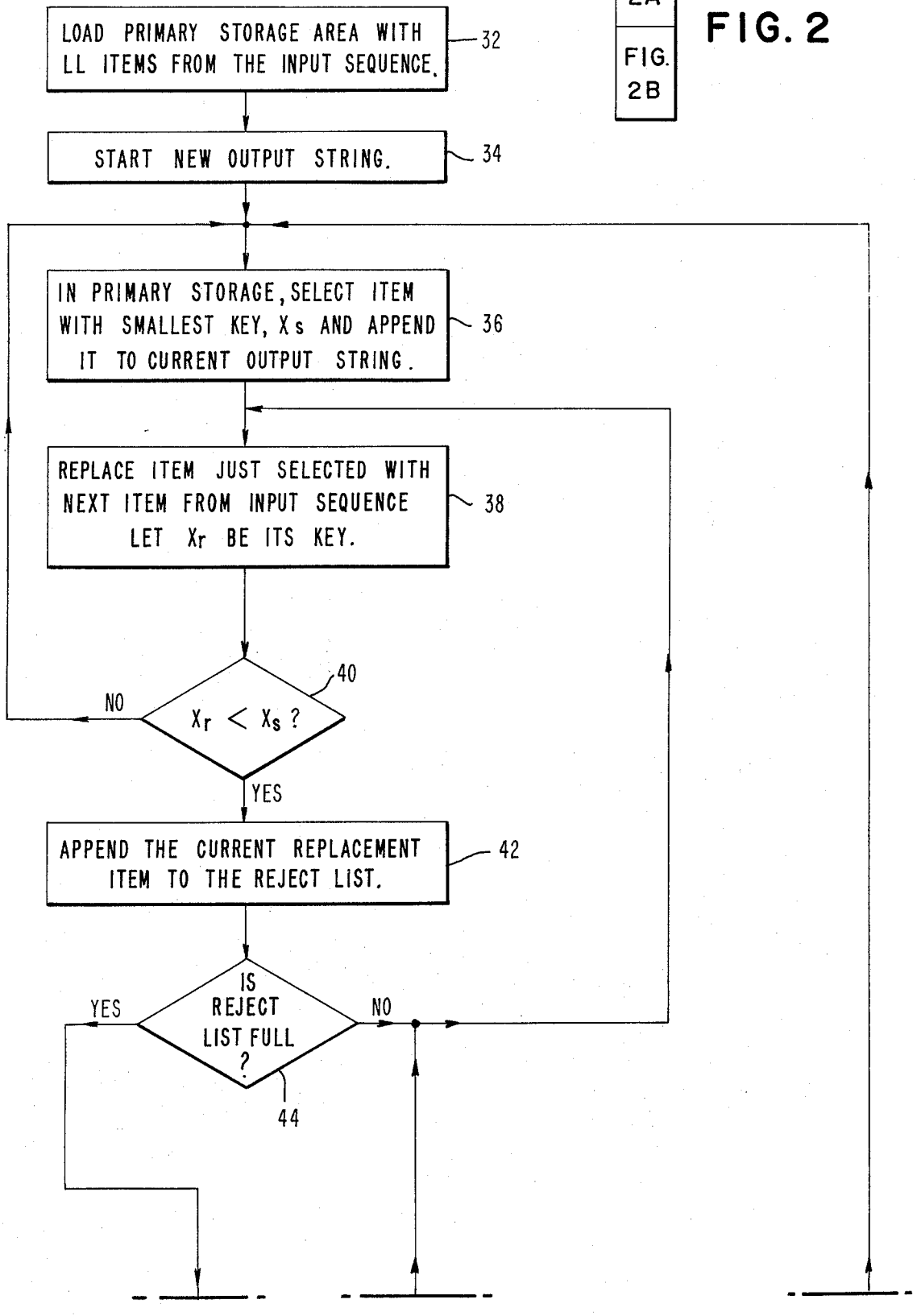


FIG. 2

FIG. 2A
FIG. 2B

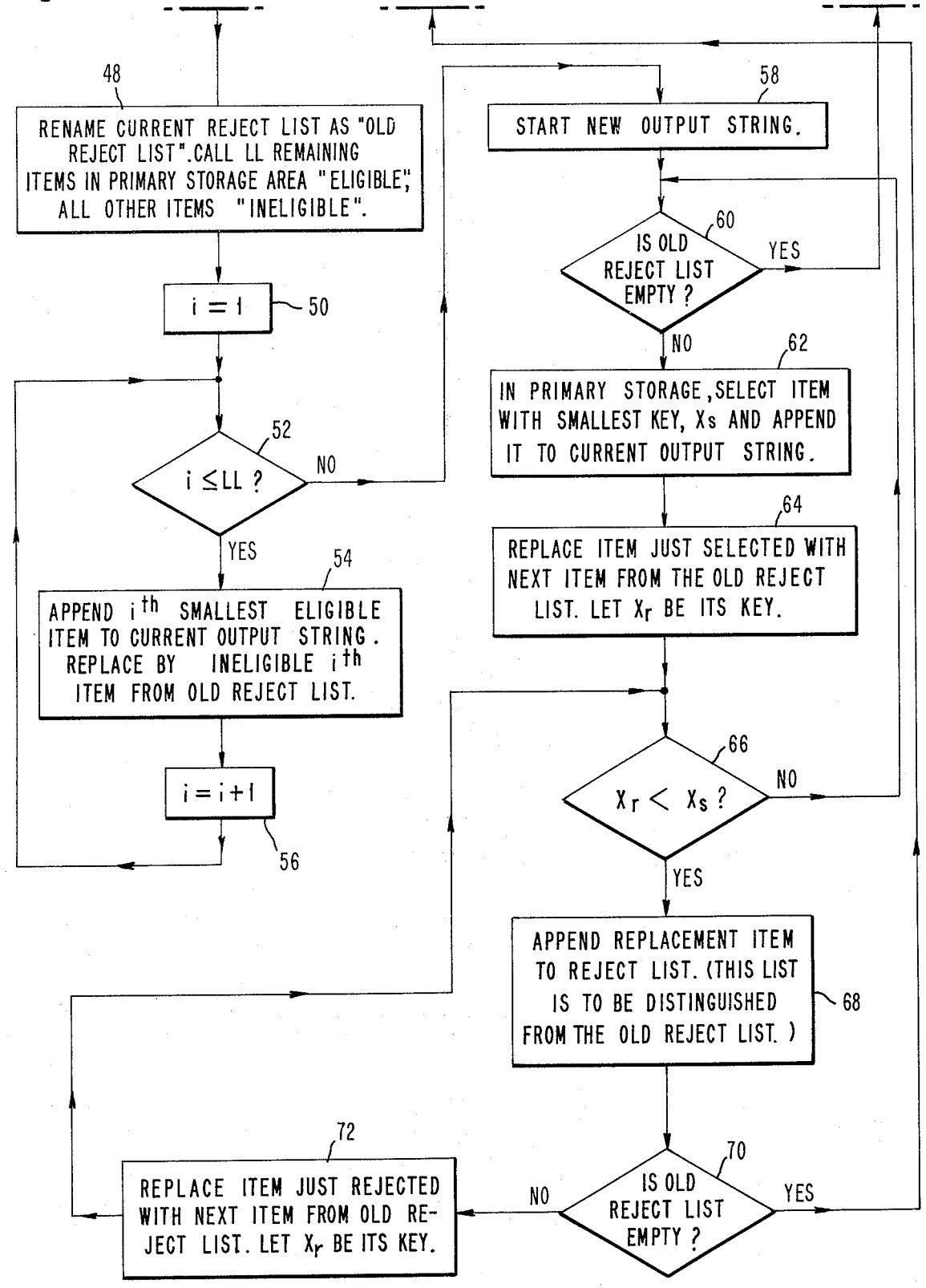

48
RENAME CURRENT REJECT LIST AS "OLD REJECT LIST".CALL LL REMAINING ITEMS IN PRIMARY STORAGE AREA "ELIGIBLE", ALL OTHER ITEMS "INELIGIBLE".
i = 1
50
52
i ≤ LL ?
NO
YES
54
APPEND i th SMALLEST ELIGIBLE ITEM TO CURRENT OUTPUT STRING. REPLACE BY INELIGIBLE i th ITEM FROM OLD REJECT LIST.
i = i+1
56
58
START NEW OUTPUT STRING.
60
IS OLD REJECT LIST EMPTY ?
YES
NO
62
IN PRIMARY STORAGE, SELECT ITEM WITH SMALLEST KEY, Xs AND APPEND IT TO CURRENT OUTPUT STRING.
64
REPLACE ITEM JUST SELECTED WITH NEXT ITEM FROM THE OLD REJECT LIST. LET Xr BE ITS KEY.
66
Xr < Xs ?
NO
YES
APPEND REPLACEMENT ITEM TO REJECT LIST. (THIS LIST IS TO BE DISTINGUISHED FROM THE OLD REJECT LIST.)
68
70
IS OLD REJECT LIST EMPTY ?
NO
YES
72
REPLACE ITEM JUST REJECTED WITH NEXT ITEM FROM OLD REJECT LIST. LET Xr BE ITS KEY.

FIG. 2B